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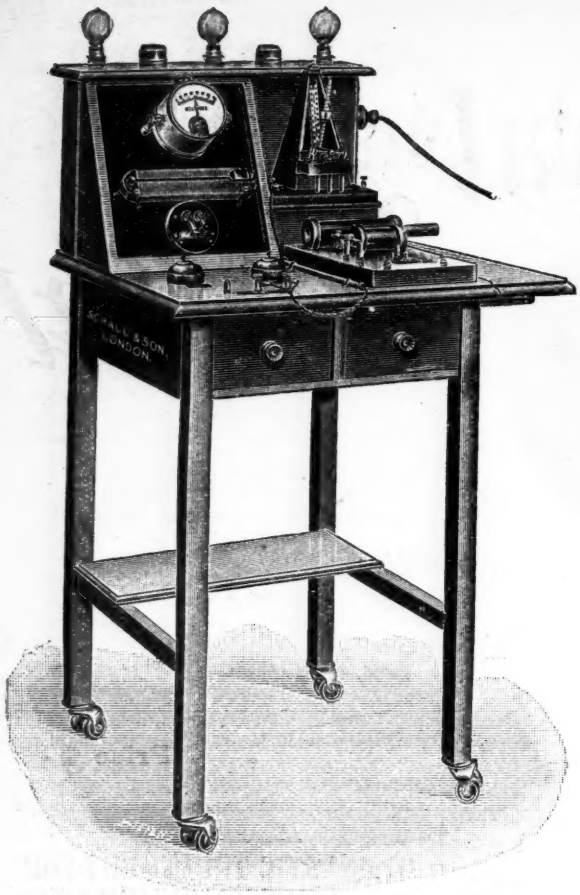

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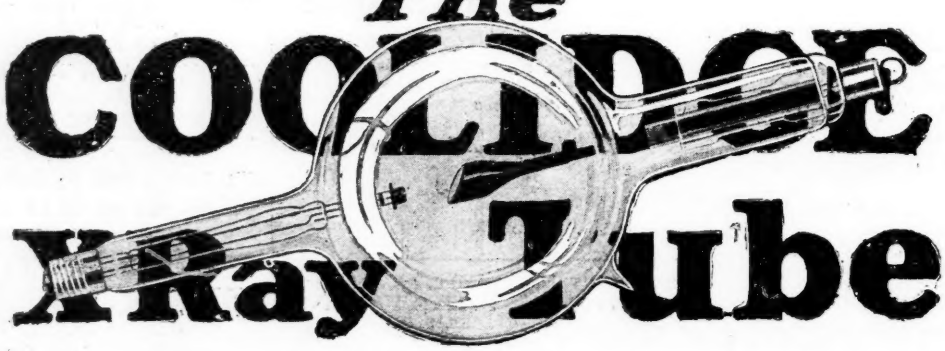

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THE SELECTION OF ABDOMINAL CASES FOR OPERATION.

WITH REFERENCE TO A SERIES OF 200 OPERATIONS.

BY

OWEN RICHARDS, D.S.O., F.R.C.S.,

TEMPORARY COLONEL A.M.S.

AT this stage of the war it is not worth while to give details of a series of cases essentially similar to others which have already been published. The value of early operation and the best technique are generally agreed on, and the percentage mortality is fairly constant. If it varies much from the average in any special collection of cases, the reason can usually be found in temporary and local conditions, which affect the time that the wounded take to reach hospital and the state in which they arrive there.

In a series of over 1,200 cases Wallace[1] found the rate of recovery to be 46 per cent. in all cases operated on, and 35 per cent. in those with wounds of the hollow viscera. In the present series the corresponding figures are 41.5 and 38 per cent. respectively.

"Successful" and "Profitable" Operations.

The percentage of patients who survive operation is, however, no real index of the value of treatment. In a large number of cases injuries are found which no surgery could cure; in others there are minor ones which would not have proved fatal even if they had been left alone. To count these as "failures" and "successes" respectively is unreasonable. In the first class of case we have failed to do what was in any case impossible; in the second our only success consists in not having killed the patient. Operation in both was unprofitable. The only kind of operation which is "profitable" as well as "successful" is one in which we find a fatal injury and cure it. These constitute the real successes.

The real failures are the cases in which the patient is wrongly classed as moribund when operation might have saved his life, and those in which a penetrating wound of the abdomen is not recognized as such until it is too late. Failures due to bad surgery are relatively rare, for the general level of surgical skill in the clearing stations is a high one. The difficulty lies rather in the selection of cases, and it is here, rather than in any point of technique, that most difference exists in the practice of individual surgeons.

Men who reckon every case "moribund" who has been wounded for more than twelve hours, or has a pulse of 120, will be able to show good statistical results. Those who operate on practically every living patient will waste much energy, and have a high death-rate—they will, however, save a few more lives.

The difficulty lies in determining the circumstances under which operation ceases as a rule to be worth while, even though it may yield an occasional success. This is important mainly for the sake of other patients. A hopeless abdominal case is only injured by operation in the sense that his life may be shortened by a few hours, while an exploration which proves unnecessary is rarely fatal. But every "unprofitable" operation means that time is wasted, and that other wounded have to wait longer. During an engagement, which is the time at which most cases have to be dealt with, this is a very serious matter. There may be in one station thirty or more cases waiting for operation, and developing sepsis and gangrene meanwhile. Every hour wasted makes the chances of all of them definitely worse. So that under these conditions any wrong selection has very far-reaching effects, for the inclusion of unsuitable cases may result in the loss of lives or limbs of other patients.

It is therefore worth while to consider what guidance can be got from the experience available. The present series is small, but it probably represents a fair average both as regards results and conditions.

Certain classes of injury may be at once ruled out. Wounds limited to the solid organs, with no progressive bleeding, and no large missile retained, do not usually need operation, and patients with other grave injuries of head, chest, or limbs are commonly unfit to stand it. In the vast majority of the remainder it can usually be recognized that the abdomen is penetrated, but the nature and extent of the internal injury is almost always unknown.

In civil surgery the risks of a known injury or disease can to some extent be weighed against those of a set operation; but here both are unknown, and the abdomen is opened on the broad grounds that most men wounded in this part of the body die, but that some of them can be saved by operation. Whether operation is necessary or not can only be discovered by performing it, and if it is at all likely to be, exploration is fully justified.

Under these conditions we have to base our decision in each case on such facts as we can know. Practically these consist of the time which has elapsed since the injury, and the condition of the patient, of which the best index is the pulse.

Interval between Wound and Operation.

In this series the time which had passed since the injury was recorded in 164 cases; 120 were operated on within twenty-four hours, and 44 later. The recoveries in the early cases were 48 (40 per cent.), and in the later 19 (43 per cent.). This latter figure is remarkable, for there is usually a higher death-rate in late cases. Wallace in 79 cases operated on after twenty-four hours found 27 survivals (33 per cent.). Probably these late cases were more carefully selected and the numbers are small, but on grounds of percentage mortality there is in this series little to choose between the two classes.

When, however, they are examined in detail, to see how far the successful cases are profitable, there is a marked difference. Of the late cases only 7 of the survivors had wounds of the alimentary canal, namely, 3 of the colon, 4 of the small intestine. Two of the latter are included in the only 4 cases of the whole series who are known to have died after arrival at the base. So that out of 19 "successful" cases operated on after twenty-four hours, only 5 (26 per cent.) were permanent cures of men wounded in the stomach or intestines. The rest of the survivors were men whose chief essential injury was haemorrhage from solid organs, mesentery, or omentum.

In the early cases the proportion is quite different; 80 cases were operated on within twelve hours, and 33 recovered. Of these, 26 (80 per cent.) were wounded in the stomach or intestines.

Apparently what happens is that most men wounded in the abdomen, with the exception of those already referred to in whom the injury is obviously limited to the liver and kidneys, have some injury to the alimentary canal. As time goes on some of these die, and others develop peritonitis which proves fatal whether they are operated on or not. The survivors, with or without operation, are almost all those whose chief injury is haemorrhage. Their bleeding has by this time ceased, and is not necessarily fatal if left alone. In these late cases, then, there is a much greater chance of performing an unnecessary and unprofitable operation. This is not shown in statistics, where unnecessary operations, unless they kill the patient, are shown as successes.

The question is what extent of delay renders operation as a rule unprofitable. A German surgeon in an advanced operating centre was led by his experience[2] to fix a limit of twelve hours. This is certainly too low. Out of the 15 recoveries in this series amongst those operated on between twelve and twenty-four hours, 10 (66 per cent.) were wounds of the alimentary canal.

A distinction has already been drawn between operations which are "successful" in the sense that the patient survives them, and those which are "profitable" in the sense that they cure an otherwise fatal injury. If we assume that wounds which open the stomach or intestine are necessarily fatal if untreated, and that haemorrhage is not, the proportion of profitable operations in this series to those which were merely successful is—

In the first twelve hours	4 to 1
In the second twelve hours	2 to 1
Later	1 to 3

It is impossible to lay down any rule (this series includes a successful resection after thirty-six hours), but roughly it seems that operation is very profitable in the first twelve hours—and well worth while in the second twelve hours.

After this time the chances are in favour of its being unnecessary, even if the patient survives it—so that preference should always be given to early cases, even if their condition is less good.

General Condition: Pulse.

As regards the pulse the cases may be divided into those with a rate under 120, and those with a rate of 120 or over. The pulse was counted on the table before the anaesthetic was given and after measures had been taken to improve the patient's condition by rest and warmth. The quality of the pulse is almost equally important, but cannot be so accurately expressed. Here the distinction in mortality is sharply marked. Of the 131 cases in which the pulse was counted, in 77 it was under 120, and of these, 42 (54 per cent.) recovered. Of the 54 in whom it was 120 or over, only 14 (25 per cent.) recovered.

As far as these cases are concerned, therefore, the chance of survival of men with a pulse under 120 is more than double that of men with a more rapid pulse, and this in spite of the fact that some of the most seriously injured cases had originally a slow pulse, which rose suddenly in the course of the operation.

To make a rule never to operate on cases with a pulse over 120 would, however, in this series, have resulted in the loss of about a dozen lives. The most unpromising cases can occasionally be saved—for example:

Cpl. P., a delicate-looking youth, in civil life a chartered accountant, took part in a raid on June 27th, 1916. He was returning in charge of six prisoners when the enemy opened fire with a machine-gun. He and his prisoners tumbled hastily into our trench, and he fell on to a bayonet which entered his abdomen and chest.

Seven hours later he arrived in hospital collapsed and pulseless. After rest, warmth, and infusion, the pulse became "just perceptible." He was pale and cold, with a rigid abdomen and occasional haematemesis. There seemed no prospect of improvement, so his abdomen was opened, a quantity of blood cleared out, and two wounds of the stomach repaired. In the course of the night he vomited violently and burst open his wound. This was sewn up again, and the third day he was rather better, with a pulse of 120. His haemothorax then became septic, and was drained. He recovered, and was sent to the base on July 29th. The medical officer in charge notes that his general condition was then "excellent."

The objection to risking a death on the table is largely sentimental. If the patient is as fit as he is ever likely to be, and has a reasonable chance of surviving the operation, this danger may be faced like any other. The operation may be unsuccessful, but it is not likely to be unnecessary. But if conditions do not allow of all cases being treated promptly it is clearly better to take those with a low pulse rate first, and to try and improve the condition of the others meanwhile.

Cases of Apparently Slight Wounds.

If care is taken to exclude those who have been wounded too long, and those whose condition is too bad, there still remains the danger of failing to include those who have scarcely any symptoms. Minute wounds of the abdominal wall, without pain, rigidity, or vomiting, are sometimes associated with serious internal injuries—for example:

Case 1.—Pte. W., admitted February 1st, 1917, with tangential bullet wound of lower abdominal wall received four hours before admission. Condition excellent; pulse 90; no vomiting; abdomen soft, movable, and painless; no tenderness except over the actual track. Wound explored; a slit half an inch long found in the peritoneum. Laparotomy: Three perforations of the small intestines. Repair; recovery.

Case 2.—Cpl. C., admitted January 14th, 1917, with small bomb wound near the umbilicus received two and a half hours earlier. Condition very good; pulse 90; no rigidity or vomiting. The wound was explored and found to penetrate. Laparotomy: One wound in the small intestine, plugged by the missile. Repair; recovery.

Case 3.—Spr. D., small central wound of abdomen received twenty-six hours before admission. Condition very good; pulse 100; vomited once on being hit, never since. Abdomen soft and free from tenderness. The only positive symptom a slight "diarrhoea pain." Some free blood, a wound of the jejunum, which was empty. Repair; recovery.

Case 4.—Second Lieutenant C., admitted December 21st, 1916, with minute grenade wound in right iliac fossa received nineteen hours earlier. This appeared, and was considered, a superficial graze, and the patient came in as "G.S.W. eyes." Pulse 100; no rigidity; had vomited once only. There was slight local pain under the wound. Explored: Much free blood; one wound of caecum, three of small intestine. Repair; recovery.

As is seen in these four cases, the results of operation before symptoms occur are very good. Their absence is probably due to the wounded gut being empty at the time, and if it can be repaired before it fills and leaks no infection of the peritoneum need arise.

The only way to avoid missing these very profitable cases is to explore every wound of the abdominal wall, front or back, whether symptoms are present or not. If the missile is in the wall, the patient is quit of it at the cost of a two-inch incision. If the track is found to penetrate, or is lost in the direction of the peritoneum, or if the skin is peppered with a number of minute wounds, the best course is to open the abdomen rather than to miss the best opportunity by waiting for signs of peritonitis to develop.

Organization of Operations.

The only other difficulty which arises in selection is to balance the claims of abdominal cases against those of other wounded in busy times. Keen surgeons are apt to concentrate on these technically interesting cases to the prejudice of other men whose lives are equally valuable, and who have more chance of being rendered fit for further service.

This tendency can be controlled by having an experienced and sensible surgeon in charge of the pre-operation ward, whose duty it is to decide the order in which cases go to the theatre, and, if necessary, the surgeons to whom they are allotted.

The real remedy, however, is to be found in eliminating waste of time, which is the chief reason why any cases, abdominal or other, fail to receive prompt treatment. Most time is wasted, not in actual operating, but in getting patients in and out of the theatre, anaesthetizing and cleaning them. If there is a sufficient supply of stretcher-bearers under a competent N.C.O., and if two tables are available for each surgeon, so that a second patient can be anaesthetized and cleaned on the other table by the time the first operation is finished, this kind of delay can be entirely got rid of. The operator has only to change his gloves and go straight on.

The other avoidable cause of delay is slowness in operating. Provided an operation is gentle and thorough, the quicker it is done the better. Men wounded in the abdomen are nearly all suffering from shock, what pulse they have is liable to fade away under prolonged exposure of their viscera, and ten minutes more or less may turn the scale between death and recovery. So that in the interests of the individual patient, as well as of others, speed is essential. Rapid work depends more on character than on manual dexterity. Method, decision, and silence are essential to it, and a clock in the theatre is the only known antidote to self-deception.

A competent surgeon, with a good sister helping him, can open the abdomen, search the small and large intestines, and close it, in twenty minutes. Ordinary repairs will extend this time to half an hour. But operators who habitually take an hour or more over a simple case should not be allowed to attempt this branch of surgery.

Conclusions.

1. The decision as to whether a man wounded in the abdomen should be operated on or not is usually based on the time which has elapsed since the injury and the rate and character of the pulse.

2. Of the patients who survive operation performed in the first twelve hours a high proportion will have had their lives saved by it, and this is true in a lesser degree of those operated on in the second twelve hours. After this time most of those who survive operation are those whose injuries were not originally fatal.

3. Men with a pulse of 120 or over have less than half the chance of survival of men with a lower pulse.

4. Recently wounded men, with a rapid pulse, should nevertheless be operated on, provided that their condition is as good as it is ever likely to be, that they have a reasonable prospect of surviving the actual operation, and that the time taken does not prevent the proper treatment of other wounded.

5. Every wound of the abdominal wall, however slight, should be explored, whether signs of internal injury are present or not. If it is found to be penetrating, the abdomen should be opened.

6. The necessity for deciding between the claims of abdominal and other cases can be best avoided by good theatre organization, the provision of two tables for each surgeon, and by not allowing slow operators to do abdominal work. If these measures are insufficient the decision should be left in the hands of the surgeon in charge of the pre-operation ward.

REFERENCES.

1 *British Journal of Surgery*, April, 1917. 2 *Bruns's Beitrage*, Kriegschirurgisches Heft 106, iii.

ABDOMINAL OPERATIONS AT AN ADVANCED OPERATING CENTRE.

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BY

CHARLES F. M. SAINT, M.D., M.S., F.R.C.S.ENG.,

CAPTAIN R.A.M.C.(T.).

The Operating Centre.

THE centre was situated in a village in advance of the corresponding group of casualty clearing stations. The roads between them at the time presented a very rough surface, and were heavily charged with transport, so that at least one hour's very bad journey was saved.

The accommodation comprised part of a building, without any special heating or lighting arrangements, and marquees. The heating was done by oil stoves, the lighting by an acetylene plant. In the building were the operating theatre, sterilizing room, and a post-operative room of twelve beds, while outside were the reception marquee and thirty-eight extra beds, partially distributed in a long ward of four contiguous marquees and in two separate.

The operating theatre was large enough for two tables, had a tiled floor, and large windows looking both east and south. The walls were distempered white. The sterilizing room adjoined the theatre, and was fitted with a large metal-lined washing-up trough. The post-operative ward of twelve beds was a large, light, airy room, with distempered walls and a parquet floor. The marquees were conveniently arranged adjacent to the building. The reception marquee was fitted with four pairs of trestles for stretchers, and served also as pre-operation and resuscitation departments. The big ward of four marquees joined together had accommodation for twenty-six patients, and two other single marquees were each fitted with six beds, one for officers and one for badly infected cases.

The Staff.

With the exception of the first few days, when a second team was attached (Captain Stevenson, R.A.M.C.), the operative work was done by one surgical team, consisting of surgeon, anaesthetist, sister, and theatre orderly, while the general administration was carried on most of the time by a section of the field ambulance to which the centre was attached. Four extra sisters were attached to superintend the nursing in the wards, the staff of orderlies being supplied by the field ambulance. At a later period, with an increase in the military activities, three extra surgical teams were attached to the centre, and the beds increased to 75. A special marquee was set apart for resuscitation, and a second for those cases considered as hopeless on admission, the reception marquee being utilized only for the reception of cases and the preparation of those to be operated on at once.

PRE-OPERATIVE TREATMENT.

Special efforts were made to evacuate the abdominal cases as quickly as possible from the line, and all concerned displayed the greatest keenness in achieving this. How far it succeeded will be seen in the study of the time intervals between wounding and arrival at the centre.

The reception marquee was always kept very warm, and on arrival the patient was taken to it, examined, and judged fit or unfit for operation.

If considered fit for operation he was washed and put in pyjamas, and morphine and atropine administered hypodermically if necessary. It was not uncommon for the patient to arrive already deeply under morphine; this was found to be especially dangerous in those cases with chest wounds, as great difficulty was sometimes experienced with the respiration after the operation. Rinsing of the mouth with water was allowed, but no drinks. The urine was always examined before operating, but if the patient failed to pass it himself catheterization was deferred till he came into the operating theatre. The operation was commenced one hour after his arrival. At the suggestion of Captain Stevenson a special stretcher was used for these cases to avoid any excessive amount of lifting about. A coarse palliasse was stitched down the sides so as to leave two tunnels through which the stretcher poles could pass, and two iron bars with rings at the ends were slipped over the pole handles to keep them apart. Over this was placed a ground sheet and then an ordinary sheet. The advantage of this was that the patient remained on the palliasse until he arrived in the ward, the poles being slipped out when he was placed on the operating table.

If the patient was considered unfit for operation the usual resuscitation procedures were carried out. He was made as comfortable as possible, morphine was administered if necessary and heating up was done by a Beatrice stove in a kerosene tin with a chimney leading under a cradle over the stretcher. Stimulants were given hypodermically as required, and saline, preferably by the intravenous method. In a few cases blood transfusion was performed, but only one of these was an intraperitoneal lesion. The method used was vein to vein by means of an improvised tube—an ordinary 6 in. glass testing pipette with $\frac{1}{8}$ in. lumen; it was bent into a U-shape, the limbs of the U being 1 in. long. A small flange was made at the ends to prevent the tube slipping out of the veins. The tube was sterilized and washed through with liquid paraffin before use (soft paraffin is undoubtedly better). The median basilic veins were used, an injection of $\frac{1}{4}$ per cent. novocain being given to produce anaesthesia. In one case, where the blood refused to flow into the vein of the recipient, a second incision was made in the neck and transfusion made into the external jugular vein, which was seen to empty with each inspiration. The veins were connected for twenty minutes. The tube can easily be modified for an artery to vein transfusion, and may be made of metal. The method is not so good as Crile's No. 17 transfusion tube, but in an emergency is easily carried out, especially if none of the usual means is at hand. In the abdominal case so treated the pulse-rate came down from 142 to 108 in twenty minutes and remained so for about half an hour, when the patient quite suddenly collapsed again and died in another hour. The time for operation was settled by the progress of the case.

If the interval between wounding and admission was more than eighteen to twenty-four hours expectant treatment was adopted. The patient was put on a Fowler frame, the wound dressed, and fomentations applied to the abdomen, if necessary. Morphine was given, and fluid by the mouth gradually commenced.

When the case was judged hopeless the patient was made as comfortable as possible, morphine was not withheld, and fluids were allowed by the mouth.

A chamber for heating the pyjamas was made of a box the bottom of which was knocked out and replaced by wire netting. It was placed on a stand with a Beatrice stove underneath. By this means a stock of warm clothing was always ready for use.

OPERATIVE TREATMENT.

The patient was taken to the operating room, which was kept at a temperature of 65° to 70° Fahr. The anaesthetic administered was chiefly ether, reinforced at times by chloroform, and given by the Shipway apparatus. In the worst cases continuous oxygen was given simultaneously by attaching a cylinder. If the patient had been unable to micturate, a catheter was now passed and the urine examined.

The skin was prepared under the anaesthetic; it was shaved with spirit soap for preference, followed by the

application of turpentine, if it could be obtained, then more spirit soap and methylated spirit, and finally 5 per cent. picric acid solution in spirit.

Dry sterile towels were placed next to the patient, and covered by hot towels wrung out of 1 in 40 carbolic. Sterilized mops were used wet out of 1 in 10,000 biniodide lotion, and abdominal swabs out of hot saline. Instruments were boiled and kept in 1 in 40 carbolic acid, knives, etc., in spirit, after cresol. Masks were worn by surgeon and assistant, and gowns with long sleeves for preference. The lotion for the hands was 1 in 10,000 biniodide.

The principles observed in operating were: (1) Good exposure; (2) minimum retraction; (3) gentle manipulation; (4) speed, consistent with care and thoroughness.

The operation was begun by excising the wound; subsequently the incision was planned to obtain the best exposure of the affected area, as indicated by the position of the wound and the direction of the track. Hence in some cases it commenced at the excised wound, whilst in others it was entirely a separate opening. When separate a mid-line or transverse or oblique lateral incision was preferably employed, with a view to causing as little damage as possible to the belly wall. When the incision was completed wound gauzes were put on. The extent of the exploration was determined in great measure by the direction of the track, especially with regard to the solid viscera and to the more or less fixed hollow viscera.

When the small gut area was involved, the first loop that presented was taken, and, commencing at this point, examination of the entire length of it was carried out by passing up and down. The exploration was completed as quickly and gently as possible, any exposed viscera being covered with swabs out of hot saline, bleeding was controlled at once, clamps were fixed over the holes in the hollow viscera to stop leakage and serve as guides, and other injuries were noted. Treatment was as conservative as possible, no resection being done unless the affected viscus appeared damaged beyond repair, or the risk of haemorrhage seemed too great, that is, in the solid viscera.

In the case of the hollow viscera silk was used as suture material, and a transverse line of sutures was preferred to a purse-string in holes in the gut. While a single layer only was commonly used for the small gut, in the stomach and colon an additional layer of Lembert sutures was introduced, frequently reinforced by tags of omentum or appendices epiploicae. After resection of gut end-to-end anastomosis was employed, the suture line being strengthened by a few Lembert sutures. Paul's tubes were only used if the patient was so ill that it would have been fatal to prolong the operation; both patients in whom they were employed died within a few hours of operation. Intraperitoneal bladder wounds were closed with or without drainage of the extraperitoneal track, and no suprapubic cystostomy was done. In injuries of the solid viscera, it was routine to bipp all tracks in them, with the object of controlling sepsis, and, if bleeding resulted, it was controlled by deep catgut sutures. Catgut was always used for suturing, but silk was employed for ligaturing spleen and kidney pedicles.

The cleaning of the peritoneum varied with the class of case. When solid viscera alone were injured blood clot was removed and excessive fluid mopped up, and only in a very large extravasation was a saline irrigation used. In injuries of the hollow viscera, if the extravasation of contents were quite small and limited, all that was done was local cleansing and mopping out with flavine solution 1 in 1,000. If, on the other hand, the extravasation was widely diffused, as occurred chiefly in injury to the full stomach, the upper jejunum, the colon and bladder, the peritoneum was irrigated with flavine 1 in 10,000 or saline, at a temperature of 106° F., and a pelvic drain left in for forty-eight hours, either projecting from the lower end of the incision or from a separate superpubic stab. There was no hesitation in leaving a smearing of bipp in any area which appeared rather soiled, and similarly all extraperitoneal tracks were bipped. If the foreign body was not encountered in the course of the general operation no prolonged search was made for it.

As a routine the incision was bipped and sutured in layers, the deeper layers with catgut, the skin with silkworm, including the superficial aponeurosis or muscle fibres. If the patient was very ill through-and-through sutures of thick silk only were employed.

When both the chest and abdomen were involved the essential feature of the operation was that the abdomen was dealt with through the diaphragm from above, and that the diaphragm itself was repaired from the thoracic aspect. The wound was excised and the injured rib removed for four or five inches. The incision was then carried on, if necessary, along the rib or intercostal space to the abdomen, reaching the edge of the rectus; in other words, it took the direction of the intercostal nerves. The wound in the diaphragm was enlarged if required, the excision extending in some cases right to its costal attachment. By this proceeding the splenic and liver regions were freely exposed by a minimum amount of retraction or none at all, and operations which by the abdominal route had often given rise to much difficulty became relatively easy as the injured viscera presented in the aperture. Indeed, in two cases the spleen was found prolapsed through the wound in the diaphragm, and in one of them a considerable portion of the fundus of the stomach was also present as well as the splenic flexure of the colon. The abdominal lesion having been dealt with, the aperture in the diaphragm was bipped and sutured with strong catgut and the abdomen closed. The chest condition was then investigated. Extravasated blood was removed, any lung track bipped and sutured, and the pleural cavity irrigated with 1 in 10,000 flavine and mopped dry. Finally the parietal incision was bipped and sutured up completely in layers, no drainage of the chest being employed. The anaesthetic for these cases was chloroform and oxygen given by the Shipway method. No detrimental effects were noticed as a result of this method of procedure.

Before leaving the theatre, if the patients were much shocked, an intravenous infusion of 1 to 1½ pints of saline was given. The injection which proved most satisfactory was composed of 3 per cent. gum acacia, 1 per cent. glucose, and 0.9 per cent. sodium chloride. With the injection, a hypodermic of camphor gr. ij in ether ʒ ss was usually given.

POST-OPERATIVE TREATMENT.

On coming round from the anaesthetic the patients were propped up either with pillows or on a Fowler's bed, and everything possible was done to stimulate them. If the stomach was injured, a pint of saline with 1 oz. of brandy was given every four hours by the rectum and liquids by the mouth after twenty-four hours, sips at first, gradually increasing the amount. In injury to the small gut, especially if low down, small quantities of liquid were given by the mouth from the beginning and rectal saline with brandy as above described. In injuries of the colon as much fluid and stimulant as possible was given by the mouth. When an extraperitoneal injury of the bladder and rectum was present in addition to intra-abdominal lesions, the bowels were confined, if possible, for seven days with pil. opii gr. j, given two or three times daily as required.

When the chest was involved, respiratory difficulty was combated by position and the administration of oxygen, and hypodermic injections of camphor gr. j in ether ♏ xv were freely given, in some cases every half-hour for a few hours. Morphine was given at first if much pain was complained of, but subsequently omnopon was preferred as a soporific.

In all cases the patients were kept at the advanced operating centre until they were quite fit, the average being about a fortnight, and when they were evacuated they were usually on full diet.

Of the 50 cases, 33, or 66 per cent., recovered, and 17, or 34 per cent., died.

The average time of all cases before operation was 8½ hours. Excluding Case No. 11, which was 42 hours, the average was 7.6 hours. Case No. 11 was operated on because of abscess and cellulitis in the right groin and iliac fossa; there was a fracture of the ilium, extraperitoneal and intraperitoneal holes in the caecum, and several large holes in the small gut, with widely diffused extravasation and advanced peritonitis. The average time among the recoveries was 7.3 hours, and that among the deaths, omitting Case No. 11, was 8.3 hours.

TABLE I.—*Thirty-three Recoveries.*

No. of Case.	Time in Hours.	Small Gut.	Large Gut.	Liver.	Spleen.	Kidney.	Omentum and Mesentery.	Chest.	Other Complications.
1	12	1	—	—	—	—	—	—	—
3	4	—	—	1	—	1	—	1	Fractured transverse processes of vertebrae.
4	4	—	1	—	—	—	1	—	Flesh wound of thigh.
6	9	1	1	—	—	—	1	—	—
7	—	1	—	—	—	—	—	—	—
9	14	1	—	—	—	—	1	—	—
12	8½	—	—	—	1	—	1	1	—
14	12	—	—	1	—	—	—	—	Fractured sternum.
16	6	1	H.	—	—	—	—	—	—
17	6	H.	—	—	—	—	1	—	—
18	8	—	—	—	—	—	1	—	—
19	17	—	—	—	—	—	D.	1	Perforation into splenic pouch.
20	5½	1	—	—	—	—	1	—	Gut divided; anastomosis; no resection. Fractured ribs.
22	7	—	—	—	—	—	—	—	Through-and-through loin—intraperitoneal.
24	4	—	—	1	—	—	—	1	—
25	3	—	—	—	—	1	—	—	Fractured spinous and transverse processes of vertebrae.
27	5½	—	—	1	—	—	—	1	Piece of liver lying free in chest, 2½ in. × 1½ in. × 1 in.
29	3½	—	—	—	1	—	1	1	—
30	4	1	1	—	—	—	1	—	—
31	7	—	—	—	1	—	—	1	—
32	—	—	—	—	1	—	—	1	—
33	4½	—	—	1	—	—	—	1	Compound fracture of tibia and fibula.
34	18	—	—	—	1	1	1	—	—
35	5	—	—	1	—	—	—	1	—
36	—	—	—	—	1	—	1	1	—
37	12	1	—	—	—	—	1	—	—
38	5½	1	—	—	—	—	1	—	—
41	6½	1	—	—	—	—	—	—	Fractured ilium.
43	2½	—	—	1	—	—	—	1	Fractured radius, etc. (multiple).
44	8	—	—	—	1	—	—	1	—
48	7	1	—	—	—	—	1	—	—
49	5	R.	—	—	—	—	R.	—	—
50	5	—	—	1	—	1	—	—	Fractured rib and transverse process of vertebra.

H., Haematoma. R., Hernia. D., Hernia through diaphragm.

All the cases were shell wounds except No. 20 (gun recoil) and No. 30 (bomb). The stomach was wounded in one case only, No. 36 (part of wall); the pancreas also was wounded in one case only, No. 31. The spleen was excised in Cases 31 and 32, and the kidney in Cases 25 and 50. The bladder was involved in Cases 7 and 30. Resection was performed in Cases 7 and 41.

In the 50 operations—

The stomach was injured in	5	cases
The small gut in...	22	,,
The large gut in...	14	,,
The liver in	12	,,
The spleen in	10	,,
The kidney in	6	,,
The pancreas in	1	case
The omentum and mesentery in... ...	21	cases
The bladder in	4	,,
The chest was perforated in	16	,,
Associated fractures, apart from the fractured ribs in thoracico-abdominal wounds, in	18	,,
Resection was performed in	6	,,
Anastomosis was performed without resection, one of the jejunum and one of both small and large gut, in... ...	2	,,

TABLE II.—*Seventeen Deaths.*

No. of Case.	Time in Hours.	Stomach.	Small Gut.	Large Gut.	Liver.	Spleen.	Omentum and Mesentery.	Chest.	Other Complications.
2	9	—	—	1	—	—	—	—	Multiple wounds; toes and fingers amputated.
5	8	—	1	1	—	—	—	—	—
8	12	—	1	1	—	—	—	—	Both small gut and colon divided; double anastomosis; fractured ilio-sacral region.
10	17	—	1	1	—	—	1	—	Multiple; knee-joint with fracture and fractured ulna.
11	42	—	1	1	—	—	1	—	Fractured ilium.
13	—	—	1	—	—	—	—	—	(Two large protrusions of gut.)
15	9	—	1	1	—	—	—	—	—
21	5	—	1	1	—	—	1	—	(Very large protrusion of gut.)
23	2½	1	—	—	1	—	1	—	—
26	2½	—	—	1	1	—	—	—	Fractured ilium.
28	7	—	1	1	—	—	—	—	—
39	10	—	—	—	1	—	—	—	Fractured transverse process of vertebra.
40	11½	1	—	—	—	1	1	1	Compound fracture of skull; penetrating.
42	6	—	1	—	—	—	1	—	Multiple; fractured clavicle, etc.
45	9	—	—	—	—	1	—	1	Multiple wounds; both knees, head, arm, etc.
46	—	—	1	1	—	—	1	—	Fractured body of vertebra.
47	8	1	—	—	1	1	—	1	—

All the wounds were caused by shells with the exception of Cases 23 and 26 (bomb wounds).

The kidney was involved in two cases (Nos. 15 and 39); the bladder also was injured in two cases only (Nos. 5 and 26). Resection was performed in four cases (Nos. 5, 28, 42, and 46). Case 45 had two wounds of lung and one of heart. The spleen was excised in Case 47.

In the 17 deaths there were—

2 cases in which the intra-abdominal injury was limited to solid viscera:

Case 39.—Injury to liver and kidney and fractured transverse process of vertebra. *Post mortem* there was no sepsis, and the liver presented the typical appearances of delayed chloroform poisoning.

Case 45.—In this case there were, in addition to a ruptured spleen, two perforating wounds of the lung, a wound of the left ventricle of the heart, and multiple peripheral wounds, including both knee-joints.

3 cases in which the stomach was perforated (Cases 23, 40, and 47).

2 cases in which the small gut alone was injured (Cases 13 and 42).

2 cases in which the large gut alone was injured (Cases 2 and 26).

8 cases in which both large and small gut were injured (Cases 5, 8, 10, 11, 15, 21, 28, and 46).

8 cases had fractures associated with the intra-abdominal lesions apart from the fractured ribs of the patients with thoracico-abdominal wounds. These included three fractures of the pelvis and one penetrating head wound.

Almost all the deaths occurred within twenty-four hours of the operation. There were—

3 splenectomies with one death (Case 47).

2 nephrectomies with no death.

6 resections with four deaths (Cases, 5, 28, 42, and 46).

2 anastomoses without resection; one of the jejunum (Case 20) recovered, and the second, a double anastomosis of small and large gut (Case 8), died.

16 cases with associated perforation of the chest, with three deaths (Cases 40, 45, and 47).

No untoward results were observed in those cases in which the foreign body was not removed at the operation. No case underwent a second operation, and no chest required reopening. In no case did the wound break down, although there were one or two stitch abscesses, which occurred in the region of the original wound. The sutures were not removed before the seventeenth day.

AN ABDUCTION SPLINT FOR THE FEMUR.

BY

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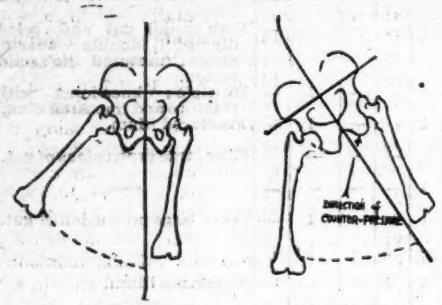
THE war has demonstrated that for the early treatment and transportation of patients with fractures of the femur Thomas's knee-splint is the best general utility splint, and that rigid extension from the ischial tuberosity is practical. There is, however, a class of fractures of the femur—that is, those in the upper third—which presents great difficulty to treatment with Thomas's splint, particularly when accompanied by extensive flesh wounds of the buttocks and hips. These cases require abduction as well as extension. Their wounds should be available for dressing. They and their splint should be easily transported, and immobilization of the fracture maintained.



Abduction: Pelvis straight. Abduction: Pelvis tilted.

FIG. 1.

There is no splint in use at present which performs all of these functions. Thomas's splint does not produce abduction, and the ring interferes with the dressing of high thigh and buttock wounds. Bradford's frame, the Hodgen-Balkan combination, and Sinclair's bed cannot be transported. The Jones abduction frame is cumbersome, expensive, and often very uncomfortable. All of these tie the patient and hold him so that he is unable to move. Sinclair's bed tilts him up the wrong way—head downwards—so that pus tends to track upwards. All of these appliances produce abduction at the hip-joint by swinging the leg away from the mid-line of the body; thus the leg protrudes from the side of a stretcher or bed and is bumped against in transport. There is another way of producing abduction, that is, by tilting the pelvis. The diagrams (Fig. 1) will explain this. By making use of this principle and bearing in mind that most high compound fractures of the femur are accompanied by extensive flesh wounds of the buttocks, thighs, or hips, I have devised a splint, based upon the lines of the Thomas, which has proved useful in my hands.

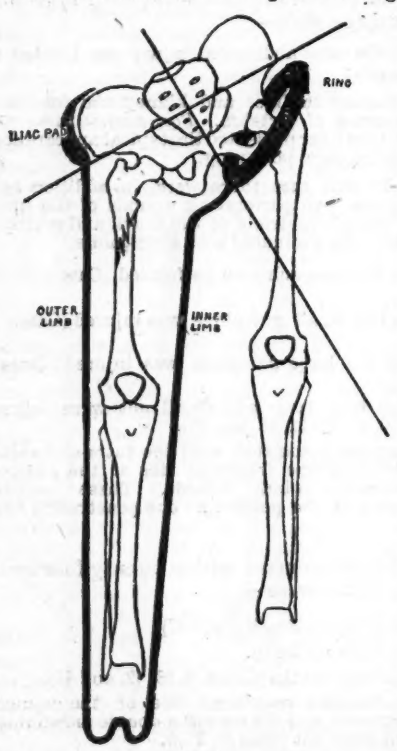


FIG. 2.

The Thomas ring is transposed to the uninjured thigh, producing a base for extension against the ischial tuberosity on the sound side of the pelvis (Fig. 2). Coming from this ring is the inner rod of the splint, which has an offset near its origin for the genitals. This rod is continued as in the ordinary Thomas into the outer rod which fastens to an iliac pad, since the ring is on the opposite thigh. This pad fits just below and parallel to the crest of the ilium on the same side as the fractured femur. The pad is continued into a broad band which passes round behind the pelvis and fits snugly to the hollow of the sacrum. When the pelvis is tilted by counter force on the opposite tuber ischium, this pad impinges, not on the iliac crest, but just below it on the plane of the ilium, which is well protected by the gluteus medius muscle. In front the iliac pad and the ring are connected by an iron rod running transversely across the body (Fig. 3). This is adjustable for width, so that the splint will fit any sized man. The band which passes around the back buckles to this transverse bar in front. The outer rod of the splint is also adjustable, and serves the double purpose of increasing the length of the splint and of varying the abduction angle.

FIG. 3.

The material used is $\frac{3}{8}$ in. iron rod for all parts except the pelvic band, which is a strip of sheet iron 2 in. wide, curved on the flat to fit the back (Fig. 4). The ring is made in varying sizes, from 20 in. to 26 in. A 22 in. ring is the best for universal use. The adjustments are made by means of a coarse screw and nuts. The ring and the iliac pad are well padded. The pelvic band is lightly padded. These parts are covered with leather, and the pelvic band continued into a strap. The buckle is fixed to the transverse bar in front.

This splint is applicable to any case in which abduction is required. It produces a maximum true abduction angle of 45 degrees, and can be adjusted to any lesser angle. The absence of a ring round the wounded thigh leaves space for dressings. The hip-joint is fixed. The back, arms, and sound leg are free. This enables the patient to move about in bed, changing the pressure points, and thus preventing bedsores. He can sit up on a back rest. He can raise his buttocks off the bed by making a tripod of his shoulders and the heel of the sound leg, and thus use a bedpan in comfort. One patient has been able to roll over and sleep face downwards. The splint is light and inexpensive compared to other abduction appliances, and is as easily transported as the ordinary Thomas.

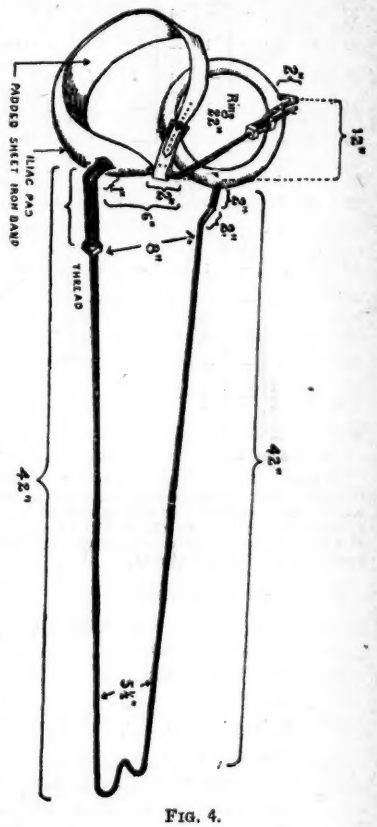


FIG. 4.

Fixed extension can be changed to weight and pulley extension when desired. I have been using a graduated spiral spring extension on the principle of the spring

balance. This reads in pounds. I have seen the ischial tuberosity bear a push of 20 lb. for months without making the skin sore.

Flexion at the hip can be obtained by bending the splint or by elevating the foot as with a Thomas. I have seen no tendency for scoliosis to persist after the splint is removed. Within a day or two the lumbar vertebrae resume their normal position.

Two of the cases which I have treated with this splint follow. The *x*-ray plates are shown as black and white drawings, since the plates were too thin to make good prints.

CASE I.

Driver S. Bullet wound, September 30th, 1917. Entrance wound in left groin; exit left great trochanter. Operation same day: Wounds excised and cleaned; bipp. Comminuted fracture of femur—upper fragment in abduction. Abduction splint applied. October 20th: Comfortable; no fever; wounds clean. Body covered with boils due to pediculi. Boil over sacrum ruptured. October 25th: Boil over sacrum healed; no bedsore.

November 16th: *X* ray showed spiral fracture through lesser trochanter with a split running into great trochanter and moderate comminution. Upper and lower fragments in good alignment. Abduction at hip of 35 degrees. Some callus near lesser trochanter.

November 17th: Wounds healed. Bony union—all movements at hip and knee good. December 15th: Up and walking in calliper splint. Both legs are the same length.

CASE II.

Pte. J. Bullet wound, October 22nd, 1917. Fracture of left femur at lesser trochanter. Operation: Foreign body removed; wound cleaned; Thomas splint.

November 10th: *X* ray showed spiral fracture beginning just above the lesser trochanter and following the spiral line,

A B

FIG. 5.—Tracings of *x*-ray plates of Pte. J. A, Fracture while on Thomas splint. Upper fragment in abduction. Angulation at fracture and consequent shortening. B, Fracture while on abduction splint. Fragments in line with slight over-correction and 1 cm. over-extension.

leaving the lesser trochanter intact on the upper fragment. Considerable comminution and loss of some cortex. Upper fragment is turned out in abduction and is flexed at the hip. Lower fragment in poor line. There is marked angulation at the point of fracture. Plate shows some hazy callus, probably not bony.

Operation, November 16th: Fragments forced into position; callus broken up. Nails driven into condyles for extension. Abduction splint applied. On November 18th *x* ray showed marked improvement. There was slight over-correction (Fig. 5). Abduction angle lessened from 45 to 35 degrees. Alignment perfect.

December 12th: Condylar nails loose; removed. Adhesive leg extension. December 25th: Union firm.

Measurements:

	Left.	Right.
Great trochanter to adductor tubercle ...	41 cm.	40 cm.
Anterior iliac spine to adductor tubercle ...	45 cm.	44 cm.
Anterior iliac spine to internal malleolus ...	85.5 cm.	85 cm.

The fractured femur is 1 cm. longer than the sound one.

A METHOD OF CITRATED BLOOD TRANSFUSION.

BY

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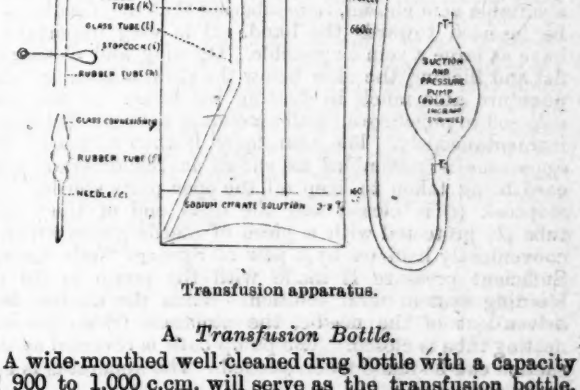
TRANSFUSION with citrated blood has had a fairly wide use in civil practice during the past few years. Reports have varied concerning the satisfaction this method has given. Some workers report excellent results. Others have experienced certain drawbacks, especially the occurrence of reactions after transfusion. Although the method of citrate transfusion is very simple, definite precautions must be observed or the blood will undergo changes, while outside the body, that may render it toxic. The very fact of the apparent simplicity of transfusion with citrated blood has undoubtedly led in many instances to a lack of appreciation of the care necessary in carrying out the technique, with consequent undesirable after-effects; blood is a very delicate tissue, and must be handled accordingly. The chief consideration is to get the blood quickly and cleanly into the citrate solution so that coagulation changes, which always begin the moment the blood leaves its containing vessel, may be stopped as soon as possible. The passage leading from the vein to the citrate must be of large diameter, as short as convenience will permit, and absolutely clean. The blood must be well mixed with the citrate at once. With unsuitable apparatus, clotting will probably occur in the tube system, which, although it may not entirely occlude the lumen, will slow the flow to such an extent that the blood undergoes considerable change before reaching the citrate. This is the kind of blood which tends to produce reactions when transfused. With properly constructed apparatus and careful technique, reactions ought to be of infrequent occurrence.

APPARATUS.

The apparatus shown in the diagram has been found satisfactory. It is simple in use and can easily be made out of material at hand.



Transfusion apparatus.

A. *Transfusion Bottle.*

A wide-mouthed well-cleaned drug bottle with a capacity of 900 to 1,000 c.cm. will serve as the transfusion bottle. It should be short and wide, rather than long and narrow, since this shape diminishes the length of intake tube necessary. Three marks are made on the bottle with a file, one at the 660 c.cm., one at the 760 c.cm., and the other at the 860 c.cm. levels, indicating 500, 600, and 700 c.cm. of blood respectively. It is well to use a glass pencil as well to make the marks more distinct. 160 c.cm. of a 3.8 per cent. solution of sodium citrate (isotonic), made up with freshly distilled water and filtered, is placed in the bottle, which is stoppered with a cotton plug wrapped

in gauze. A second piece of gauze is tied on over the stopper and neck of the bottle. It is then autoclaved; half an hour at 105° C. should be the minimum. Where a number of transfusions are being given half a dozen or more of these bottles are prepared at once.

B. *Bleeding System.*

The needle (*a*) should be of a large bore—1.5 to 2 mm. internal diameter was found to work well—and not more than 3.5 cm. long (1.5 in.). It should have a fairly large olive-shaped base. The needle is the most important part of the apparatus, and requires careful attention. Before each bleeding it should be carefully sharpened. The most important consideration in the sharpening is to produce a good spear-point. If the point is well protected when not in use by a metal barrel or piece of rubber tubing, sharpening will require only a moment or so. The needle must be kept scrupulously clean, and after each bleeding should be washed out at once, all fragments of fibrin or clot removed from the base, and small pieces of cotton-wool soaked in liquid paraffin thrust through the lumen with the stilette. The whole needle is well oiled before being put away.

The rubber connexion (*b*) should be flexible, and not more than 8 cm. long (3 in.). The inner surface should be smooth, and the lumen slightly smaller than that of the glass inlet tube (*c*). If the rubber connexion fits snugly over the base of the needle, tying it on is not necessary.

The glass inlet tube (*d*) is made of a large-bore glass tubing about 6 mm. internal diameter. It should extend below the level (A) of the solution in the bottle.

C. *Transfusing System.*

The needle (*e*) employed has a bore about half the size of that used for bleeding. The length is not important. As shown in the illustration, the needle is attached to a short glass tube (*g*) by means of a small piece of rubber tubing (*f*).* The free end of the glass tube is thrust into the end of the long rubber tube (*h*) after the needle is in the vein. The rubber tube (*h*) may be of any convenient length. The glass tube (*l*) is bent so that the end projects into the lowest part of the bottle. In this way almost every drop of blood in the bottle may be given.

D. *Pump.*

The bulb of an Ingram syringe serves as a pump with the valves arranged as in the diagram. Suction or pressure can be made by reversing the ends.

PROCEDURE OF BLEEDING.

The donor's arm is extended at a right angle to the body. The skin of the antecubital space is scrubbed up with soap and water, and the sterilization completed with alcohol. A tourniquet is applied to the arm high up, and a suitable vein chosen, remembering that the needle is to be inserted towards the hand. It is very important to have as large a vein as possible. Opening and closing the fist and flicking the skin below the point chosen for venepuncture aids much in dilating the veins. At the point selected to puncture a small amount of novocain is injected intracutaneously. The tourniquet is then released. The apparatus is assembled as shown in the diagram, great care being taken to keep all the open parts sterile. The stopcock (*i*) is closed and the open end of the rubber tube (*h*) protected with a piece of sterile gauze which is conveniently held on by a pair of Spencer Wells forceps. Sufficient pressure is made with the pump to fill the bleeding system with solution. When the air has been driven out of the needle, the stopcock (*c*) on the connecting tube is closed. The pump bulb is reversed so that suction can be made when needed. The apparatus is now ready for use.

The tourniquet is again tightened sufficiently to make the veins stand out well, but not enough to obliterate the pulse. The cuff of a blood pressure apparatus makes an excellent tourniquet with a pressure kept at 50–60 mm. of Hg. A small nick is then made through the skin with the point of a scalpel. The bottle is placed on a stand close to the patient's arm in such a position that there will be no kinking of the rubber connexion when the needle is in the vein. Slight suction is next made in the bottle. The skin opening is mopped dry with a piece of sterile gauze and the needle inserted for a short distance beneath the skin before entering the vein. The stopcock (*c*) is then opened and the needle is pushed into the vein immediately. The blood follows the column of solution down the tube without leaving an air space. A moderate degree of suction is maintained, and the donor continues to open and close his hand slowly, care being taken that he does not move his arm. It is essential to keep the needle immobile. The operator should hold it throughout the bleeding, steadying his hand against the donor's arm. With the free hand the bottle is given a rotary motion every few seconds in order to ensure thorough mixing of the blood. In doing this care should be taken to avoid pulling on the needle. With these precautions 500 to 700 c.cm. of blood can be easily and quickly obtained.

If clotting occurs for any reason, such as the needle slipping out of the vein or air leakage, and the blood ceases to flow, the tourniquet should be released, the stopcock closed, the needle withdrawn from the vein, and another attempt made with a fresh apparatus (needle, rubber connexion, and glass tube), using the same receiving bottle. It is usually better to take the other arm.

When the blood has reached the desired amount the tourniquet is removed, the stopcock closed, and the needle withdrawn. The bottle is again agitated for a few seconds.

If the donor's veins are small and the needle method fails, the vein can be cut down upon and a cannula used. Inserting a cannula into a vein is more difficult and time-consuming than the needle method, and offers greater possibility for infection.

The bottle of blood is placed in a glass jar containing water of about body temperature, in which it is kept during transfusion. The pump is reversed and the blood is now ready for transfusion. It will be noted that a column of blood is left in the intake tube after the bleeding has been stopped. This is done in order to avoid drawing into the bottle any little clumps of fibrin which may have begun to form immediately after the cessation of blood flow through the tubes. Leaving this blood does no harm. The blood should be given as soon after the bleeding as possible. If it is left standing for some time, changes may occur which make the blood less beneficial or even toxic.

PROCEDURE OF TRANSFUSION.

The recipient's arm is prepared in a manner similar to that described for the donor and a small amount of novocain injected into the site chosen for the vein puncture. It is well to tie the rubber stopper down to the bottle with two strips of adhesive plaster in order to prevent it from flying out when the pressure increases. After these preparations have been completed, sufficient pressure is put on the pump to fill the transfusing system with blood. The stopcock (*i*) is opened to let the air out, then closed. The tourniquet is next tightened. As soon as the needle enters the vein blood flows out through the short glass tube; the tourniquet is immediately released, the apparatus is connected up, the stopcock opened, and the pump started.† This technique is simple, and, if carried out carefully, there is no danger of forcing air into the vein. If the veins are collapsed or constricted, as is the case in certain patients with shock and haemorrhage, it may be necessary to cut down on the vein and use a glass or silver cannula instead of the needle.

By using a needle it is scarcely possible to force the blood in too rapidly. With a cannula care must be taken to go slowly. Ten minutes should be the minimum time for the introduction of 500 c.cm. of blood. Care should also be taken to close the stopcock before the air bubbles begin to pass up the tube.

REMARKS.

The question may be raised whether it is not better to coat the inside of the bottle and tubes with paraffin. Theoretically this would be a good thing, and in "peace" times it can be carried out. In rush periods, however, it

*A needle with a close-fitting metal connexion is more easily handled. The metal connexion is slipped into the open end of the rubber tube (*h*) beforehand.

†The operator should hold the rubber-glass connexion firmly throughout the transfusion.

is quite impractical on account of the time required for the coating. Furthermore, judging by the excellent results obtained without the use of paraffin it seems questionable whether a paraffin coating is necessary.

An isotonic solution of sodium citrate is used instead of the 10 per cent. solution customarily employed, since it is felt that this maintains more nearly normal conditions for the blood. The amount of sodium citrate contained in the 160 c.cm. of "isocitrate" is approximately 6 grams. No harmful effects have ever been observed from the injection of this quantity of citrate, which is very much less than the supposedly toxic dose; 0.5 per cent. citrate has been shown to be sufficient to prevent clotting when well mixed with blood. When 500 c.cm. blood are drawn into 160 c.cm. of a 3.8 per cent. solution the resulting mixture is 0.9 per cent. citrate. With 700 c.cm. blood it is 0.7 per cent. An amount of blood as large as 800 c.cm. may be taken into this amount of citrate with safety if the blood flow is well maintained and the blood and citrate are thoroughly mixed. The sodium citrate in this mixture equals 0.6 per cent. In bleeding quantities over 700 c.cm. the flow through the needle frequently begins to slow up and mixing the blood and citrate becomes more difficult.

Results.

This method was used under rush conditions. Forty-four transfusions were given to 38 patients. The patients transfused were cases of haemorrhage and shock—chiefly the former. Donors were always tested beforehand for compatibility of blood. The amount of blood given in a single transfusion varied from 400 c.cm. to 700 c.cm. The average quantity was between 500 c.cm. and 600 c.cm. In cases of very marked anaemia a second transfusion was occasionally given. Briefly it may be stated that the immediate effect of citrated blood was the same as that seen after the transfusion of blood by the other methods in common use. The blood pressure increased from 20 to 40 points afterwards. On one occasion there was a rise of 50 points, after only 450 c.cm. of blood. The general improvement was maintained and increased. The patients stood operation well, and subsequent progress was fully as satisfactory as seen ordinarily following transfusion. Of the 38 cases transfused 25 were evacuated to the base in good condition, and 13 died—a mortality of 34 per cent.

No reactions of any consequence were observed. In several instances there was slight chilliness during or immediately following transfusion, which soon passed off without further discomfort. It was impossible, under the rush conditions, to keep temperature charts on the majority of the patients, but in a number of instances in which temperatures were taken no rise occurred afterwards.

Advantages.

Aside from the chief advantage of its being a "one man job," this method has several other considerations in its favour. The apparatus can be made from materials easily obtained. The technique of transfusion is simple and quickly carried out. The bleeding can be done in a conveniently arranged room outside the resuscitation ward. The blood is then carried into the ward and given at the bedside without the necessity of moving the recipient, thus avoiding injury, which is often done to the patient in shock by moving him to the operating theatre, or even on to a table near by.

Summary.

The use of citrated blood for transfusion seems to fill a definite need in that the technique is relatively simple, easily acquired, and can be carried out entirely by one medical officer. Furthermore, this method obviates the necessity of having the donor and recipient together, and the blood can be given at the bedside. Stress is laid on the fact that, although the technique is apparently very simple, certain definite precautions must be observed in the handling of the blood in order to obtain good results. The chief considerations in the technique are to get the blood quickly and cleanly into the citrate, to obtain prompt and thorough mixing of the blood with the citrate, and to transfuse the blood as soon as possible after the bleeding.

An apparatus is described which can easily be constructed, and has been found to work satisfactorily. The blood is received into isotonic sodium citrate—3.8 per cent. The amount of this solution—160 c.cm.—contains 6 grams of sodium citrate, which has no harmful effect. When a good blood flow is maintained through a needle of adequate calibre and the blood and citrate are well mixed, as large a quantity as 800 c.cm. blood may be obtained by this method.

A series of forty-four citrate transfusions were given under rush conditions at a casualty clearing station with good results. The immediate effect of the transfused blood and subsequent progress of the cases were fully as good as that seen following ordinary transfusion. No reactions of any consequence were observed.

DESTRUCTION OF NITS OF THE CLOTHES LOUSE BY SOLUTIONS OF CRESOL-SOAP EMULSION AND LYSOL.

BY

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AND

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THESE experiments were carried out with a view to assisting officers in charge of baths and wash-houses where the clothes of infected troops are treated in order to rid them of lice. From conversations with officers in charge of these establishments it appears that a precautionary measure frequently employed is to steep infected garments in a vat containing solutions of cresol-soap emulsion. There exists, however, some uncertainty as to the strength of the solution and period of immersion necessary to destroy the nits of *Pediculus humanus*. In this connexion it may be pointed out that overlapping methods of disinfestation should if possible be avoided in the interests of economy. Hot water or dry heat at 55° C. destroys both nits and active lice within thirty minutes, even when protected by a covering of khaki cloth; while, if the temperature is raised to 60° C., fifteen minutes suffice. If at any period during the process of washing or drying garments they are subjected to the temperatures and periods above given, chemical solutions are unnecessary; if, on the other hand, the garments are steeped in effective chemical solutions, then it is unnecessary to use temperatures so high as those mentioned for washing or drying.

In utilizing the results of the present experiments for practical disinfestation it must be borne in mind that solutions of both cresol-soap emulsion and lysol degenerate in their effectiveness for the destruction of bacteria in relation to the organic matter with which they become charged during use, and it is probable that a somewhat similar fall in their effectiveness for the destruction of nits may occur. It has not been possible, so far, to ascertain if this probable drop in efficiency occurs, owing to our lack of knowledge of the exact condition of use. If samples of solutions actually employed could be forwarded to the Lister Institute, with the necessary data as to strength and the relations of quantity of fluid and period of use, and the number of garments treated, it would be possible to carry out the experiments necessary to obtain information on this point.

Method of Test.

Pieces of army shirt flannel on which numerous nits had been laid were immersed in the solutions for the periods shown in the accompanying tables; they were then taken out, and the superfluous fluid removed by placing on filter paper for a few minutes. After this they were placed in small entomological boxes lined with a strip of dry flannel, and carried in a thin cotton bag, suspended from the neck between skin and shirt, to incubate.

On examination of the tables it will be noted that the lysol (crude carbolic acid and soft soap emulsion) solutions are decidedly more effective than the cresol-soap emulsion solution at the higher temperature but less so at 32° F. Why this should be the case is not evident. The difference

TABLE I.—*Mortality of Nits of Pediculus humanus due to Immersion in Watery Solutions of Liquor Cresoli Saponatus Fortis.*

Temperature and Period of Immersion.	Strength of Solution.	No. of Eggs.	No. Hatched.	No. Died while Hatching.	Percentage Mortality.
	Per cent.				
Temp. 60-65° F.	2.0	94	3	7	97
	1.5	51	26	9	49
5 minutes ...	1.0	69	37	10	46
	0.5	46	41	2	11
	0.2	79	64	2	19
	2.0	106	Nil	—	100
	1.5	82	1	—	99
20 minutes ...	1.0	93	5	4	95
	0.5	68	24	10	65
	0.2	37	30	3	19
20 minutes ...	2.0	68	Nil	—	100
45 minutes ...	1.5	92	Nil	—	100
2 hours ...	1.0	64	Nil	—	100
2½ hours ...	0.5	99	Nil	—	100
22 hours ...	0.2	90	Nil	—	100
Temp. 48° F.					
20 minutes ...	2.0	95	Nil	—	100
	1.5	104	Nil	—	100
*Control** ...		85	66	1	23
Temp. 32° F.					
20 minutes ...	2.0	137	1	1	99.3
	1.5	123	Nil	—	100
*Control** ...		51	46		10

*The controls were exposed to the temperature, but not immersed.

TABLE II.—*Mortality of Nits of Pediculus humanus due to Immersion in Watery Solutions of "Lysol" (equal parts of Crude Carbolic Acid and Soft Soap).*

Temperature and Period of Immersion.	Strength of Solution.	No. of Eggs.	No. Hatched.	No. Died while Hatching.	Percentage Mortality.
	Per cent.				
Temp. 60-65° F.	2.0	120	Nil	Nil	100
	1.5	121	Nil	1	100
5 minutes ...	1.0	82	2	6	98
	0.5	79	52	7	34
	0.2	89	70	2	21
	2.0	89	Nil	Nil	100
	1.5	82	Nil	Nil	100
20 minutes ...	1.0	72	Nil	1	100
	0.5	103	46	8	55
	0.2	94	60	8	34
Temp. 48° F.					
20 minutes ...	2.0	96	Nil	—	100
	1.5	102	Nil	1	100
Temp. 32° F.					
20 minutes ..	2.0	127	1	—	99.2
	1.5	99	7	2	93

in the latter case is not great, and may possibly be largely, if not entirely, a matter of chance, dependent upon uncertainty of action at low temperatures.

An interesting feature of the series is the regular rise in the percentage of lice which die while hatching as the action of the solutions become less fatal up to a mid point, when it again declines to a minimum in proportion as the hatching ceases to be checked owing to the weakness of the solutions. It is a matter of question whether death during escape from the egg is due to the action of the fluids on the eggshell, or to a want of robustness in the larvae.

The evidence as a whole seems to establish the fact that steeping for twenty minutes in a 2 per cent. solution, either lysol or the cresol soap, is quite effective provided the temperature is not below 50° F.

A PLACARD is to be posted in the offices of town and country clerks in the State of New York stating that no marriage licence will be issued until both parties make the following statement on oath: "I have not to my knowledge been infected with any venereal disease, or if I have been so infected within five years, I have had a laboratory test made within that period which shows that I am now free from infection from any such disease."

SOME SIMPLE HOT AIR APPLIANCES FOR FIELD UNITS.

BY LIEUT.-COLONEL C. MAX PAGE, R.A.M.C., S.R.

THE rapid transference of the wounded from such organizations as regimental aid posts and advanced dressing stations to the active surgical centre at the casualty clearing station is one of the principal problems which confronts medical units in the forward areas. During this period of transport the main difficulty with which the medical officer has to contend is shock; and once the wounds have been protected and any fractures satisfactorily splinted, his efforts are directed to keeping up or improving the general condition of the patients. The maintenance of body heat plays a most important part in this respect, and is a matter which, if neglected at this stage, may prejudice the whole later course of the case by leaving the man unfit for the essential operation at the casualty clearing station. Various schemes to this end are already in use, but I think it is worth while to describe some apparatus which has proved of practical value in dealing with the problem. More elaborate and capacious plant can be designed on the same principles under stationary conditions, when time and labour are of less account. That described below is essentially portable, and can be made up by any practical man from material ready to hand.

The first need is for some means by which a constant supply of dry and warm blankets and pyjamas can be maintained, and for this purpose a blanket drying chamber is used.

Blanket Drying Chamber.

The apparatus consists of a frame 32 in. square built of 3 in. by 2 in. wood. Two sides are tenoned and the others morticed (Fig. 1); on one face of the two morticed sections

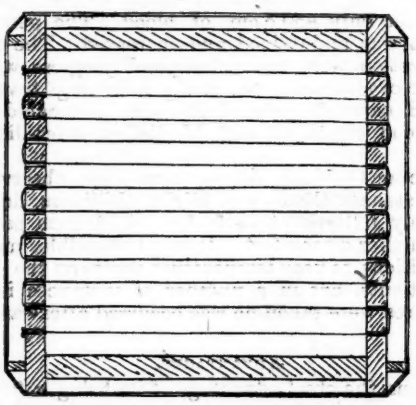

FIG. 1.—Plan of blanket rack, 32 in. square. The main frame is made of 3 in. by 2 in. wood. The central rails form a continuous length of wire or cord wound through the slots in the side members. The outer rail is made of wire or standard splinting.

are cut, at regular intervals, twelve slots half through the wood and wide enough to take ordinary telephone wire. The frame is carried as a bundle of sticks. For use they are fitted together to form a square frame. This is kept firm by lacing with a continuous cord or wire around the slots to form the rack, as shown in the drawing. The wood should be so cut that there is a ½ in. projection of the tenoned and morticed ends; a groove is cut in the middle of these projections and another wire passed round the whole frame through them to form a surrounding rail; if preferred, this rail can be made of aluminium or steel splinting (from fracture box).

To form a drying chamber the frame is suspended by cords in a horizontal position (or supported on a light stand) about 5 ft. from the ground. Blankets folded to fit are hung over the surrounding rail and fixed with a few pins. These blankets are so arranged as to form four complete sides of a box (with blanket walls). The floor will form the bottom, and another folded blanket is placed over the rack, after objects to be dried have been hung on the wires, to form the top.

Two Beatrice stoves, with a simple tin baffle plate to protect the flame, are put on the floor inside the box as the

source of heat. In use no obvious air entry or exit should be left. Under average conditions (with two double-wick stoves) the temperature inside the blanket chamber is raised to about 120° F. in twenty minutes; at this stage, when the apparatus is in use for ordinary drying, the roofing blanket is pushed a little on one side to allow of ventilation, and the contents will then rapidly dry off. If the contents are very wet the temperature in the chamber should be raised higher before free ventilation is allowed.

Simple suspension of the frame, as described above, is the most practical arrangement for forward area work; under stationary conditions it may be supported on a skeleton stand.

Use as a Hot Air Sterilizer.

The same apparatus can be used for sterilizing small batches of clothing when a steam disinfector is not available. The chamber should then be formed by at least a double fold of blanket all round, and three Beatrice stoves used. With this arrangement the temperature in the chamber can be raised to about 200° F. in twenty minutes. An exposure to this temperature for half an hour will kill lice eggs and the scabies parasite, as the garments, turned inside out, or blankets, being suspended, have their surfaces well exposed. This method does not damage the leather of breeches.

Hot Air Generator.

In an advanced dressing station the first method for raising the wounded man's body temperature is the hot air bath. For this purpose a hot air generator, as shown in the figure, is convenient (Fig. 2). It is made from a standard biscuit tin, or a four-gallon petrol tin; the latter is the stronger. The side of the tin is cut away except for a strip about an inch wide at the top, and a door may be put in the gap so made. The top is cut out and a domed cap fitted in its place. Into one side of the domed cap a short length of tin pipe is set, and a further series of lengths of tin pipe, prepared so as to telescope together, form the delivery pipe; the right angle bend is formed by an elbow of the ordinary pattern French stove piping. Solder, though useful for finishing off the dome, should not be relied on for the fixation of any part. If available, sheet asbestos may be applied to the dome and elbow. The addition of handles to the sides of the box is convenient. A double-wick Beatrice stove is placed in the box as a source of heat. The Primus pattern of stove is less reliable, and is not altogether safe for use in the closed apparatus described.

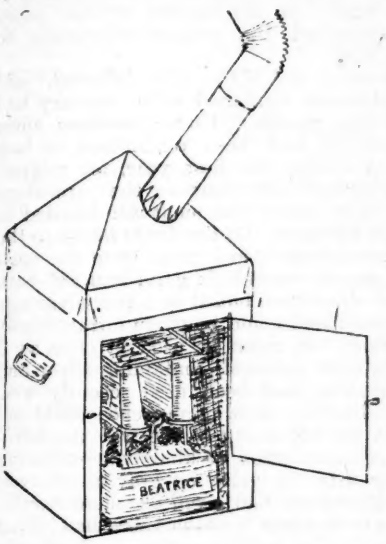

FIG. 2.—Heat generator made from biscuit box or four-gallon petrol tin.

FIG. 3.—Skeleton cradle for hot-air baths. Made from aluminium splinting.

To give a bath, a properly blanketed stretcher on trestles is used, and an air chamber formed over the trunk of the patient by means of a simple cradle (Fig. 3), the whole being covered by two or three blankets. The cradle frame may be made of skeleton splinting from the field fracture box or of stout wire. This arrangement allows dressings or operations to be carried out on the extremities while the heat is being applied. The box containing the stove is placed under the middle of the stretcher, and the piping arranged to deliver hot air just above the stretcher level. The box and contents are thus well out of the way, and only the pipe elbow projects from beyond the stretcher pole. With this apparatus a hot-air bath of from 130° F. to 300° F. can be given. For the wounded man a fifteen minutes' bath at about 130° F. is, I think, most satisfactory. The high temperature bath should be reserved for the treatment of urinary cases or myalgia under stationary conditions.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

DISORDER OF THE RIGHT EXTERNAL SEMICIRCULAR CANAL.

THE two following cases, which present many points of similarity, are of interest:

1. A young woman who had previously suffered from three attacks of retrobulbar optic neuritis, after partaking at breakfast on January 15th, 1918, of rolled ham, which was noticed to be of unusual colour and from which fat was absent, found herself on the way to business falling towards a friend on her right. She struggled against this symptom and giddiness during three days. Then vomiting set in. When seen, there was constant lateral nystagmus. The patient could not stand unsupported, and there was vomiting of cerebral type. There was no deafness to speech test, and no tinnitus. The reflexes of the lower limbs were normal. Twelve days later the nystagmus could be barely elicited; the patient could walk and stand. The condition was that of one after nine days in bed.

2. A man aged 53, after partaking at breakfast on January 26th of ham which was noted to be watery, went to business. Some three hours later he suddenly collapsed on to the floor of his office. He was removed home. His gait as he was helped was to the uninitiated that of a drunken man, and many have been the jokes at his expense. Seen five hours later, he was retching and vomiting mucus like an alcoholic in the early morning; he is not alcoholic. Nystagmus, lateral, was most marked. He could not stand or walk unaided. There were no subjective aural sensations, nor was there any deafness to speech. Now, eighteen days after the onset, there remains only slight incapacity for mental activity. During a week there was slight hissing tinnitus, and for a few days there was a distinct tendency to fall to the right.

In neither case was there paralysis of cranial motor nerves, nor drowsiness, nor any definite ptosis.

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THROUGH-AND-THROUGH RAMROD WOUND OF HEAD.

ON November 9th a girl, aged 8, was brought to me with the ramrod of a gun fixed firmly in her head. It appears that a gun had been left on a shelf, loaded with the gunpowder charge only, and the ramrod left in it. The child in pulling something off the shelf had caused the gun to fall forward, when it went off. The ramrod had entered the cranium one inch above the top of the forehead, half an inch to the left of the middle line, and was protruding for some four or five inches from a point half an inch to the right of the same line and two and a half inches above the occiput. On admission the child was conscious, but the pulse was scarcely perceptible. There was no bruising of the skin, nor any haemorrhage, and the ramrod was so firmly fixed in the skull that the point had to be sharply tapped with a mallet in order to loosen it sufficiently to allow of its withdrawal. For

this the child was given chloroform and the head shaved and the protruding end of the ramrod was painted with iodine before putting it back through the skull. Very slight haemorrhage at the point of exit followed the withdrawal. For the first two days the patient vomited when any food was given her by the mouth, and for the first day the pulse was very slow (48) and intermittent. By the morning it was regular and of good volume. The temperature was 100.8° on the first night, but by the morning of the second day both pulse and temperature were normal. During the next few days the pulse was occasionally irregular, and she complained a good deal of headache, but otherwise she made an uneventful recovery. The little punctured wounds healed in two or three days by first intention, and she was dismissed in perfect health in three weeks, having been kept in hospital long enough to make sure that no cerebral symptoms would develop later. The illustration shows the top of the head with the ramrod *in situ*.

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Reports of Societies.

PATHOLOGY OF MALIGNANT GROWTHS.

A meeting of the Pathological Section of the Royal Society of Medicine was held on April 16th, when Professor W. Bulloch, F.R.S., President, was in the chair.

Tumours Arising in Endothelium.

Dr. E. H. Kettle, in a paper on this subject, said that such tumours were not easy to recognize, as the neoplastic endothelial cell presented no distinctive characters. Some of the accepted diagnostic features were: An undifferentiated polymorphic celled type of growth; a whorled arrangement of the cells with the formation of giant cells; the close association of the tumour cells with blood vessels; and the occurrence of narrow trabeculae or elongated channels, which might contain blood. Some of these features might equally be applied to carcinomata; others appeared to have been accepted with very little critical examination. The author had as yet examined in detail only two specimens.

1. A malignant endothelioma in a woman, aged 44, who had suffered from elephantiasis of the right leg since childhood. In 1914 the limb became extremely painful; several silk drains were inserted, but amputation was performed in 1915. Recurrence ensued, and the limb was amputated through the hip-joint. Histologically the growth consisted of alveoli of cells of very irregular shape, combined with large spaces which contained fluid blood. Clear indications could be seen of its origin, especially at the periphery, where the tumour cells occurred as branching syncytial masses closely resembling vaso-formative cells, or as endothelia lining vascular spaces. A constant feature was the formation of vacuoles in the cells, and it was by the confluence of neighbouring vacuoles that the larger spaces were formed. Blood was extravasated into the spaces from involvement and rupture of capillaries in the stroma.
2. A small infiltrating growth attached to the outer margin of the left erector spinae in an infant; this showed clearly capillary formation by vacuolation of the tumour cells, and the origin of the cells of the neoplasm from the endothelium of long complex capillaries, which established communication with healthy veins.

Autologous Grafting of Malignant New Growths in the Mouse.

Dr. J. A. Murray showed a series of charts illustrating the typical sequences which are met with in autologous grafting of malignant new growths of the mouse. In a series of 405 experiments 302 positive results were recorded. Of the 103 negative autoinoculations death occurred in 53 before the lapse of four weeks, and could be ignored as delay for this period was common. The significance of the remaining 50 negative results (15 per cent.) was discussed. It was shown by a study of individual charts that the negative results might be due to a variety of extrinsic causes apart from lack of vitality in the cells of the graft. The conditions of experiment made it impossible to utilize negative results in individual cases. The occurrence of delayed positive results made the method quite unsuitable for diagnostic purposes in the human subject.

TREATMENT OF SYPHILIS.

At a meeting of the Section of Medicine of the Royal Academy of Medicine in Ireland, on March 22nd, the President, Dr. Henry C. Drury, in the chair, a discussion on the treatment of syphilis was opened by Dr. T. Percy Kirkpatrick. After insisting on the importance of early treatment, he said that efficient treatment included the administration of salvarsan or some analogous drug. He had himself followed the procedure recommended at the Military Hospital, Rochester Row, using either kharsivan or diarsenol, and had no doubt that the procedure was efficient. But the question arose whether treatment by galyl or some of the other preparations might not be as good or better. In the treatment of some patients in the early secondary stage, and in practically all in the late secondary or tertiary stages the course of treatment had to be much longer than when it was begun in the early stages. He had followed the plan recommended at Rochester Row of courses of salvarsan accompanied by mercury, repeated till a permanent negative Wassermann reaction was obtained. Some patients actively treated until an apparent cure was effected—whose blood serum gave a persistently negative Wassermann reaction—afterwards developed such parasyphilitic affections as general paralysis of the insane and locomotor ataxia. In such patients the cerebro-spinal fluid continued, as a rule, to give a positive Wassermann reaction. It was doubtful whether a definite prognosis should ever be given without an examination of the cerebro-spinal fluid. In the course of his paper Dr. Kirkpatrick expressed his acknowledgements to officers of the R.A.M.C.

Major H. C. Donald, R.A.M.C., who followed, said that the use of salvarsan combined with mercury had given very satisfactory results. Under mercury alone 83 per cent. of soldiers had been readmitted to hospitals, at least once during the first year, for relapse. Under salvarsan combined with mercury the percentage was less than 1.3. The latter statement was founded on the record of over 10,000 cases. Of the drugs in use in the army kharsivan, arseno-benzol, and galyl were the most usual, and had all proved successful; galyl had not been so efficacious as the other two, but it had the advantage that it was easily mixed and could be given intravenously with a Record syringe. It must be used at once, as it quickly became oxidized. Luargol, containing silver and antimony in combination, had been used recently with apparently good results, but their permanence could not yet be affirmed. At the beginning of the war the intravenous method of administration of kharsivan—allowing the solution to flow into the veins by gravitation—was most in use. Neo-kharsivan had given excellent results. Within the last year or eighteen months there had been a tendency to return to the intramuscular or deep subcutaneous injection, and he believed that some day it would prove to be the most successful and simple method, and well suited to dispensary practice. The objection was the amount of local pain sometimes caused. The addition of stovaine had not seemed to help much, and he preferred to mix the dose in 10 or 12 minims of distilled water, to diffuse as well as possible while injecting, and to massage the buttock well afterwards. The course at present in use in the army, as suggested by Lieut.-Colonel Harrison, R.A.M.C., was as follows:

Seven weekly doses of the arsenic compound selected were given intravenously, commencing with 0.3 gram for the first three doses, 0.4 gram for the next three doses, and then one dose of 0.5 gram, a total of 2.6 grams. If administered by the intramuscular method the doses were two of 0.45 gram, followed by five of 0.6 gram, a total of 3.9 grams. A weekly dose of 1 grain of mercury as cream was given by intramuscular injection. If at the end of the course the blood reaction was negative the patient was directed to have a blood test made at the end of two, four, six, and twelve months. If the reaction was positive or doubtful the man was put on a course of potassium iodide for fourteen days, and then given two weekly doses of 0.3 and 0.4 gram of the arsenical drug and 1 grain of mercury. Tertiary cases received the same course, repeated after intervals during which potassium iodide and mercury were administered. It was necessary to determine repeatedly the Wassermann reaction of the cerebro-spinal fluid before pronouncing a patient cured.

Major Donald had not seen many cases of syphilitic diseases of the nervous system in the army during the war, but had been struck by the marked improvement of

symptoms under salvarsan and mercury. He related the following case as an instance:

A discharged soldier, aged 49 years, but looking much older, with marked signs of tabes, practically crawling, with loss of control of bladder and rectum, presented himself for treatment, giving a history of syphilis contracted nine or eleven years before. He was treated as an outdoor patient after being detained a couple of days for spinal puncture—Wassermann positive. He was put on potassium iodide for a fortnight, and then attended weekly for kharsivan and mercury. The drug was given intramuscularly; after five injections he was walking much better, and had recovered the control of his bladder and rectum, was in good health, and looked much younger.

Major Donald thought that all cases of parasyphilis of the nervous system should be treated by salvarsan and mercury, even though at times the treatment seemed to aggravate the symptoms. He would begin by giving a course of potassium iodide and mercury for a fortnight, and then doses of 0.1, 0.2, 0.3 gram salvarsan weekly, allowing fourteen days' rest between each seven injections until four to five grams had been reached. Potassium iodide should be given in the intervals.

Captain H. S. LAIRD, R.A.M.C., said that he preferred the intravenous method of injection, on account of the pain and the liability to abscess which followed the intramuscular method. Mr. G. PUGIN MELDON considered that the treatment should continue for three months; three weekly injections of salvarsan should be given and then three at fortnightly intervals, combined with mercury during the whole period. He believed that if parasyphilitic diseases were treated early, that is to say, before actual destruction of the nerve cells and while the disease was still confined to the vascular and intercellular tissues, good results might be expected.

Reviews.

BLOOD PRESSURE.

THE third edition of NORRIS's textbook on *Blood Pressure*[1] is in every way a most complete and admirable work. After an account of the physiology, which, with the chapter on the venous pressure, is contributed by Dr. J. H. Austin, a fully illustrated description is given of the various forms of sphygmomanometers, and for ordinary work Nicholson's new instrument, a portable mercurial apparatus enclosed in a metal case, is recommended. The five phases of the auscultatory method, described by Korotkow in 1905, and introduced to the notice of the profession in this country some years later by the late Dr. George Oliver, are explained and illustrated by diagrams; this method is simple, rapid, and accurate, gives the diastolic as well as the systolic blood pressure, and among those familiar with it has supplanted all others for clinical work. Although those interested in blood pressure estimations may regard this as a truism, we believe that its adoption by those who possess and often use a sphygmomanometer is not so general as the value and easy application of the method deserve.

While admitting that there is no entirely satisfactory blood-pressure test for determining the functional efficiency of the circulation, the author considers that some of those described may throw some light on the question; he has used extensively Crampton's test for vasomotor efficiency, and places some reliance on its results. It consists in a comparison of the pulse-rate and systolic pressures in the lying-down and in the erect postures, there being normally an increase of about seven beats a minute and 10 mm. Hg in the latter. The systolic and diastolic pressures being commonly 120 and 80 with a difference, or pulse pressure, of 40, the "cardiac load" has therefore been considered to be $\frac{40}{80}$, or 50 per cent. of the diastolic pressure; in hypertension this pulse pressure percentage of the diastolic pressure may be greatly raised, and prognostic importance has been ascribed to it; but the author has not found "the cardiac load" of any value in the estimation of circulatory efficiency. A systolic pressure constantly at 160 mm. Hg or above, and a diastolic of 100, is regarded as definitely pathological at any age, and as the diastolic is far less subject to temporary variations and a better index of the mean pressure than the systolic, it is often the more important of the two; thus a constant diastolic pressure of 100 mm. Hg indicates high blood pressure, whether the systolic is 180 or 140.

The thoroughness of the review of the whole subject is further shown by the summaries of the changing phases of opinion as regards the significance of blood pressures in various conditions; thus the view that a low blood pressure exists before the appearance of physical signs of tuberculosis is rendered more than doubtful, the author quoting Janeway's observations, and concluding that hypotension is seen in the later stages when it is due to toxaemia, and that the stethoscope is a much better means than the sphygmomanometer for diagnosing incipient tuberculosis. Again, Gibson's law, that when the blood pressure expressed in millimetres of mercury does not fall below the pulse-rate the prognosis of pneumonia is good, and conversely, is certainly far from infallible. Enough, perhaps, has now been said to show the character of this valuable book of reference, and it need only be added that it is well written and appropriately illustrated.

[1] *Blood Pressure: its Clinical Applications.* By George William Norris, A.B., M.D., Assistant Professor of Medicine in the University of Pennsylvania. Third edition. Philadelphia and New York: Lea and Febiger. 1917. (Med. 8vo, pp. 448; 110 figures, 1 coloured plate. 3.50 dollars.)

HEWLETT'S "BACTERIOLOGY."

SINCE its first appearance twenty years ago Professor HEWLETT'S admirable *Manual of Bacteriology*[2] has been in constant demand and now is in its sixth edition. As the fifth edition came out in 1914 many changes have been necessary, and these have been incorporated clearly and succinctly, as is seen in the sections on septic wounds and gas gangrene. In the section on spirochaetosis icterohaemorrhagica the mode of infection is said to be uncertain, probably by water or by contact, possibly by insects, and no mention is made of rats. The work is so fully up to date as a whole and is so clearly written that it may be confidently recommended to the student as well suited to his needs.

NOTES ON BOOKS.

THE small book on the irrigation of wounds by the Carrel method, by J. DUMAS and ANNE CARREL,[3] a short review of which was published in the JOURNAL of March 31st, 1917, p. 426, has been translated by Dr. A. V. S. Lambert, of Columbia University, New York, and issued with an introduction by Dr. W. W. Keen. It was intended by Madame Carrel primarily for the instruction of nurses, but it will be found useful by surgeons also who wish to make themselves acquainted with the details of the method.

Dr. TINEL'S excellent manual of *Nerve Wounds*[4] has been translated from the French by Mr. ROTHWELL and Mr. JOLL. The original work was reviewed in the BRITISH MEDICAL JOURNAL of September 30th, 1916 (p. 465). The translation has been well rendered and printed.

The second edition of *The Panel Doctor: His Duties and Perplexities*,[5] by Dr. T. M. TIBBETTS, has appeared. The first edition, reviewed in our columns of February 10th, 1917, was, we learn, very quickly exhausted, and the author has taken the opportunity of revising the matter and bringing the subject generally up to date. The book has proved very useful to medical practitioners working under the Insurance Act, and we again commend it to their attention.

The *Minutes* of the General Medical Council for the year 1917 have been issued in a volume (Constable, 12s.), which contains also the minutes of the branch councils, of the executive and other committees, and various reports,

[2] *A Manual of Bacteriology, Clinical and Applied.* By R. Tanner Hewlett, M.D., F.R.C.P., Professor of Bacteriology in the University of London. Sixth edition. London: J. and A. Churchill. 1918. (Pp. 769; 31 plates and 69 figures in the text. 14s.)

[3] *Technic of the Irrigation Treatment of Wounds by the Carrel Method.* New York: Paul B. Hoeber. 1917. (Cr. 8vo, pp. 90; 11 plates. 1.25 dols. net.)

[4] *Nerve Wounds: Symptomatology of Peripheral Nerve Lesions Caused by War Wounds.* By J. Tinel, Ancien Chef de Clinique et de Laboratoire de la Salpêtrière. Authorized translation by Fred. Rothwell, B.A.Lond. Revised and edited by Cecil A. Joll, M.B., M.S., B.Sc.Lond., F.R.C.S.Eng. London: Baillière, Tindall, and Cox. 1917. (Sup. roy. 8vo, pp. xii+317; 323 figs. 15s. net.)

[5] *The Panel Doctor: His Duties and Perplexities.* By T. M. Tibbetts, M.D., M.R.C.S., L.R.C.P., D.P.H. London: John Bale, Sons, and Danielsson, Ltd. 1918. (Cr. 8vo, pp. 59. 2s. 6d. net.)

including that of the Education Committee. The *General Index* to Volumes XL to LIV (1903–1917) has also been issued (2s. 6d.). A prefatory note states that the number of entries has been curtailed where experience has shown that this can be done safely without impairing the usefulness of the publication.

DIETARIES IN THEORY AND PRACTICE.

VISCOUNT DUNLUCE and Captain M. GREENWOOD have written a very interesting report of an inquiry into the composition of dietaries, with special reference to the dietaries of munition workers. The work was carried out under the supervision of the Food Investigation Committee appointed by the Minister of Munitions, and the report is published by the Medical Research Committee.[1] It is prefaced by a valuable sketch of the evolution of scientific opinion on the physiology of diet and metabolism, beginning with the researches of Voit in the early seventies. It appears that the literature on this subject is riddled with the results of quoting at secondhand without verification at the fountain head.

From the mass of information digested by them the authors conclude that the increase in demand for energy with increasing muscular work, the body weight of the subject being known, can be determined with fair accuracy, but only within comparatively narrow limits, and that no conclusion can be drawn as to the requirements of a man doing sedentary work. Current dietetic standards of energy needs are ultimately based upon statistical averages deduced from a sampling of diets actually eaten, but their validity is finally established by exact experiments. Further, external conditions have an immensely important influence on the energy demand. The authors deal shortly with the protein question, summing up the spirit of modern teaching in an ingenious metaphor.

In the section on working-class diet statistics collected before the war they remind us that such data only give the quantities of food purchased, not the amount of food consumed. "Waste, in the culpable sense of deliberately spoiling or throwing away edible food, is of hardly more than rhetorical interest," but there is an unavoidable waste of calories and protein in the preparation of food, especially of food containing much fat. In comparing statistical diets with theoretical diets, the reader is advised to subtract mentally at least 10 per cent. from the former. Allowing for various sources of error, the authors think that the pre-war statistics fail to demonstrate any necessity for the average working man to consume a diet equivalent to more than 3,500 calories a day. Nevertheless, the heavy incidence of disease upon the poorer classes and the prejudicial effect of underfeeding upon resistance to infectious disease shows that it is not well to build much upon statistics.

The authors' special inquiry was made during the spring and summer of 1917 in the hostels and canteens serving the munition workers in various factories. The general results and detailed analyses are shown in tabular form. The circumstances under which the census was made were peculiar in three respects: there was an acute shortage of potatoes at the time, there was coincidently an energetic "eat less bread" campaign, while sugar was very scarce. These three factors combined to lower the proportion of carbohydrates, and the *contre-coup* of the bread economy was a remarkable increase in the consumption of fat and an appreciable rise in that of protein. Had the slogan been not "eat less bread," but "eat more fat," the response, they think, would have been the same—a curious and instructive instance of what may happen when national habits are disturbed. With regard to potatoes the authors state that, as was pointed out in our columns some months ago, the existence of large stocks of potatoes in the country is, owing to transport difficulties, by no means the same thing as the availability of potatoes in industrial centres. Dealing with war-time German dietaries the authors conclude that the German working man has been decidedly worse off than the English labourer since the war, and even since the intensive submarine campaign and the increasing world-shortage of foodstuffs; but the extent to which the German civilian population has suffered in health, and therefore in efficiency, from shortage of food is uncertain.

[1] Special Report Series, No. 13.

The authors' investigations afford no reason to suppose that those who served the nation in munition factories last year had any cause to complain of the provision made to sustain their physical strength and health. But time will force changes upon the nation; the provision of so many calories from fat and meat which could be made six months ago, is now no longer feasible. Happily, economic necessity and the teaching of physiology, tentative though the latter may be, seem to point in the same direction. The substitution of energy derived from potatoes and cereals for a large proportion of that yielded by fats and animal proteins, while involving hardship, cannot scientifically be condemned; and the lesson seems to be that popular tastes and prejudices are rooted more in social habit than in basic physiological demands.

As the Medical Research Committee points out in its introduction, this report not only supplies data of primary importance to those who have to solve the social and administrative problems of rationing the civilian forces of this country, but adds definitely to our general knowledge of the actual dietaries of the population. The coming of war caught the study of nutrition in a period of great activity in the collection of new facts; the sudden and exceptional demand for practical guidance found many gaps in the body of dietetic knowledge available for practical use. When the food shortage became imminent physiologists were able in some degree to state in quantitative terms the actual energy consumed in various kinds of productive work, but they could not assess at all fully the adaptability of the human machine to new and presumably less favourable conditions. As a guide to the application of existing knowledge as a whole to the problems of practice the present report should be of the utmost service.

ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee twenty-six cases were considered, and £278 voted to twenty-three of the applicants. The following is a summary of some of the cases relieved:

Widow, aged 68, of L.S.A.Lond. who died in 1907. Present income from investments £22 4s. 11d., which is much less now. Has tried to supplement this by taking in paying guests, but not successfully. Requires help towards expenses. Voted £12 in twelve instalments.

Widow, aged 40, of a surgeon in the Royal Navy who died in 1906. Was left with three children, aged now 22, 16, 14. Income from pensions £98, investments £15, and receives £40 a year as matron of a boys' school. Desires help towards education of her son. Voted £5, and referred to the Guild.

Daughter, aged 77, of M.D.Glasg. who practised in London and Glasgow. Applicant's income from dividends £44, and she has one boarder at 17s. a week. Her main income is derived from letting her cottage furnished during the summer, but since the war has not been successful. Rent and rates £37. Voted £15 in twelve instalments.

Daughter, aged 49, of M.D.Glasg. who practised at Bawtry and died in 1872. Prior to the war was able to make a living by taking in paying guests, and as her house is on the East Coast she has had none since September, 1915. Lives in own house, and pays £8 for rates. Is now doing a little clerical work, but this is not sufficient to keep her. Relieved three times, £30. Voted £10 in two instalments.

Daughter, aged 51, of M.D.Dubl. who practised in England and died in 1904. Applicant had a school for some years, but is now completely blind in one eye, and has almost lost the sight of the other, and had to give it up. Has a small pension from a blind society, and help from the Guild. Relieved twice, £25. Voted £18 in twelve instalments.

Daughter, aged 60, of M.R.C.S.Eng. who died in 1873. Applicant has no means, and suffers from rheumatism. Entirely dependent on sister, who cannot afford to keep her. Relieved thirty-four times, £278. Voted £12 in twelve instalments.

Subscriptions may be sent to the Acting Honorary Treasurer, Dr. Samuel West, at 11, Chandos Street, Cavendish Square, London, W.1.

The Royal Medical Benevolent Fund Guild is now called upon, as a result of the war, to deal with many widows and children who, in happier times, would not have thought of asking for assistance. It is glad to receive secondhand clothing and household linen. The class of clothes most wanted is that suitable for boys and girls working in offices, for women, and for old men. The gifts should be sent to the secretary of the Guild, 43, Bolsover Street, W.

British Medical Journal.

SATURDAY, APRIL 27TH, 1918.

THE BUDGET.

DURING the first two years of the war, taxation increased at half-yearly stages, but the taxpayer is now apparently considered sufficiently hardened to be able to dispense with this particular method of tempering the wind for the time of shearing. We are, of course, assuming that there will be no second Budget for this year, and in view of the very heavy extra taxation proposed—£114,000,000 in addition to the new luxury tax—few will feel inclined to doubt the validity of that assumption.

The old adage, "il n'y a que le premier pas qui coûte," has, like many others, been completely reversed in this war, and the Chancellor's statement reminds us that in the financial as well as in the military world the severity of the struggle is intensified with the progress of the months, and that even the close of the war will leave us to face a period of grave difficulty. The huge sums borrowed in this country are to a large extent spent here in the manufacture of munitions, including the multifarious equipment of our own armies and those of our allies, and the abundance of money and the almost universal prevalence of war bonuses, foster a feeling of prosperity which is reflected only too thoroughly in the spending habits of the great majority of the people. The after-war transition period will test our powers of organization to the utmost, and the necessity for a sound and far-seeing financial policy arises very largely from the fact that it would be almost impossible for any government to deal with the post-war industrial and social problems and at the same time to increase taxation to cover current expenses.

The declared policy of both Mr. Bonar Law and his predecessor has been to maintain permanent, as distinct from temporary, taxation at such a level as to produce sufficient revenue to ensure that if the war comes to an end at the close of the financial year, the normal expenditure and the debt charge can be met without new borrowing or taxation. In an interesting passage he compared the policy of the German Government in this matter with our own, pointing out the widening margin between the German revenue and annual debt charge, and expressing the opinion that it was due to the fact that the wealthier classes in Germany held the political power and that the German Government were "absolutely afraid to force taxation upon them."

An examination of the Chancellor's proposals for raising the additional revenue necessary if our financial policy is to be continued, shows that in the main he has followed fairly closely the precedent of the past few years—it was put into operation in this country for the first time on a great scale in 1909—namely, that of looking to the wealthy class for the chief part of the revenue, and redressing the balance by indirect, and if possible direct, taxes on other classes, including the industrial worker, accepting gratefully the yield of such taxes but not perhaps regarding them as of primary importance from the point of view of the Exchequer. For instance, on this occasion the full rate of income tax is raised from 5s. to 6s. in the £, the super-tax and the death duties are increased, and a further attempt is made to bring a bigger proportion of the large agricultural profits within the income tax net, while on the other hand further indirect taxes are imposed on sugar, tobacco, spirits and beer. One feature worth noticing is that, as regards income tax, the man whose total income is not greater than £500 is no worse off than before; in fact, if he is in a position to claim the new allowance of £25 in respect of his wife he will pay less. The further extension of the allowance in respect of children is a welcome sign of improvement in the incidence of the tax. The allowance was originally restricted to incomes which did not exceed £500 and amounted to £10 only; it now applies up to incomes of £800 and to the extent of £25; when any further change is made we hope that the restriction dependent on total income will be swept away, and that the amount of the allowance will be made to increase with the amount of the income—if a working man is fairly entitled to a deduction of £25 for a boy who in present circumstances is probably earning almost enough to support himself, it would seem reasonable that a professional man, who is keeping his son at school to the future good of the country, should have at least an equivalent or greater relief.

We note with pleasure that, though the rates of income tax on earned and unearned incomes exceeding £500 are to be increased, the rates for army and navy pay will remain as before. Even at that level they press heavily on scales of pay fixed originally with regard to pre-war conditions, but these are days when small mercies are more than ever welcome.

The most interesting of the Chancellor's proposals is the *ad valorem* luxury tax based on a levy of 2d. in the shilling for purchases of scheduled articles. The desirability of checking in some way the extravagance that undeniably exists—though not perhaps to the extent sometimes suggested—will be recognized as readily as Mr. Law's adroitness in leaving the schedules to be drawn up by a Select Committee of the House. The proposal breaks new ground in our fiscal system, and a thorough examination of the best method of collecting the tax will be essential; the experience of the French Government will no doubt point the way, but the trading methods of the two countries differ in several material respects, and much caution will be needed in approaching the problem. Given a sound system and a careful and willing administration, this new tax may quite possibly succeed in combining the virtues of both direct and indirect taxes while retaining little of their respective vices; in other words, it may become a valuable source of revenue, economical to collect and not burdensome to the payer; a hastily constructed or ill-considered scheme will court failure. From this standpoint it seems unfortunate that it was necessary to discuss the tax in public before it could be enforced; if it is now postponed for several months immediate buying of luxuries will "queer the pitch" for the new tax; on the other hand, if it is put in force quickly it may permanently suffer from a lack of foresight in its construction.

As we have already suggested, this Budget bears a family resemblance to its ancestors, and what we have said of them is true of this one, too—it takes the necessary money mainly from those who can afford to pay without acute suffering, but leaves out no one who can afford to pay anything worth collecting. No doubt a perfect system would relieve some and would tax others more heavily, but so far as the means at his disposal allow the Chancellor appears to have dealt out even-handed justice between various taxpayers. It remains for the latter to shoulder the burden with

what self-denial and fortitude they may possess, knowing that it is on the financial efforts of the country now that the future well-being of the nation will largely depend.

IF GOOD WHY NOT BETTER?

THERE was a letter in the *Times* on April 23rd which raised a point of some consequence, but in a way so confused and confusing that it may well have given the general public an erroneous impression. It dealt with the recent promotion of a number of medical officers to be major-generals. This promotion is, in fact, mainly a matter of terminology. The officers were all surgeon-generals before and ranked as major-generals. Their new titles do little more than bring them into line with officers in other branches. Technically all the surgeon-generals had ceased to belong to the R.A.M.C., the highest rank in which is lieutenant-colonel. An officer promoted to be colonel ceases, technically, to be an officer of the corps, which in this respect is regarded as though it were a regiment. The last point made by the writer may also be dismissed briefly. He is surprised that of eleven officers promoted nine came from Irish schools and only one each from England and Scotland. We have not verified his calculation, but assuming its correctness the explanation is simple. It is that at the time when these officers entered it the Army Medical Service was not popular in the English and Scottish medical schools. This unpopularity was, in the opinion of the British Medical Association, the Universities, and Royal Colleges in England and Scotland, well merited. These bodies combined to obtain reforms, the results of which are seen in this war, when for the first time in its history the Army Medical Service has won a success not surpassed, if indeed equalled, by any other branch of the army. The success is due partly to good administration, but chiefly to the application of scientific methods to the prevention of disease, and the surgical treatment of the wounded, which is mainly the prevention of wound infection—preventive surgery. The great merit of Sir Alfred Keogh, himself an Irishman, and of Sir Arthur Sloggett, his colleague in France, was that from the first they recognized that their true policy was to give as free a hand as seemed to them possible to the clinical physicians, surgeons, and pathologists who came forward to help the army. Unfortunately things did not move quite as fast at home as they did in France, and as we believe they have moved recently in the Mediterranean Command and in Mesopotamia, where bitter lessons had first to be learnt.

The regular Army Medical Service is still dominated, or was until very recently dominated, by the idea that seniority in the service meant competence, and that without seniority there could not be competence. There was this amount of justification, that the senior officers were the survivors of a much larger number who had been dropped by the way. But new conditions call for new methods, and the notion that only a senior regular officer can be a good administrator ought to be given up. The argument would seem to have been: such and such a berth at home is a surgeon-general's; which of the surgeon-generals shall have it? Some surgeon-general is appointed, even though he may have been tried and failed abroad. It is difficult to write about the matter without an appearance of animus, but the unfavourable impression these senior regular officers made, one after the other, when they appeared before the Select Committee on military recruiting medical boards cannot be passed over or forgotten. The effect on the public mind was so unfortunate that the Secretary of State for War went down to the Committee one morning and announced that the Army Medical Service would cease to be responsible for the medical examination of recruits, and that the duty would be turned over to the Ministry of National Service acting through civilian medical boards. The Ministry of National service is now concerned also in the discharge of men from the army, but a cumbrous dual system is at present maintained.

Army medical administration was not successful at Gallipoli or in East Africa; it made a disastrous failure in Mesopotamia. It has been splendidly successful in France mainly, we suggest, because Sir Arthur Sloggett recognized the limitations of regular officers, and relied on physicians and surgeons and pathologists experienced in civil hospital work at home to settle certain principles of administration in consultation with him. It has achieved a large measure of success at home because Sir Alfred Keogh kept an open mind and encouraged civilian experts to give their best, as they were ready to do, in spite of the most discouraging obstruction in the Home Commands. We cannot see that the enemy activity on the Western front is any ground for delaying the institution of reforms at home. Rather is it an added reason for immediate action. We have no doubt that the new Director-General will receive valuable guidance from the highly competent Army Medical Advisory Board recently appointed.

It is a real misfortune, not perhaps so much for the Army Medical Service of to-day as for the future of the Royal Army Medical Corps, that there should be so much truth in the statement of the writer of the letter to which we have referred, to the effect that regular officers of the corps will leave, and are now leaving, the scientific—and, it may be added, the clinical—side for the administrative side, "as there, apparently, lies the only road to promotion." The courageous attempt to put the medical service of the Air Force on a sound footing as a scientific organization failed owing, if rumour speaks true, to the opposition of the Army Medical Department. But that is another story, too long and sad to tell now.

MEDICAL PRACTITIONERS UNDER THE MILITARY SERVICE ACT.

WE mentioned last week in a paragraph on this subject that the Central Medical War Committee was in conference with the Ministry of National Service and the Insurance Commissioners with regard to the position of medical practitioners under the Military Service Bill. The bill became an Act on April 18th, and renders liable to military service all medical men who had not attained the age of 56 at that date. The Ministry of National Service has undertaken to supply office assistance to the Central Medical War Committee towards carrying out the necessary arrangements, and a Government official to assist Dr. Cox in this way has been appointed by the Ministry, and will serve also as a liaison officer between the central professional committees and the Ministry. The official selected is Mr. S. P. Vivian, who at one time was one of the senior clerks of the Insurance Commission and has more recently been employed in the Ministry of Food. Nominal lists of all medical men coming within the scope of the Act will be prepared according to areas, and arrangements will be made for their early physical examination by boards outside their own areas. They will be graded on ordinary lines and the professional committees will be able to obtain from the Ministry information as to the fitness

for practice of medical men in Grade 3. A certain number of those between 43 and 50 who are physically fit and surplus to local requirements may be sent directly into military service; but in general men over 45 will be urged to undertake substitution practice, to release for service fit men under 43. It is intended that wherever possible substitution shall be local and shall not involve the removal of a man from one area to another. A special inter-departmental committee will be set up to consider cases in which the adjustment of the interests of the Government departments concerned presents difficulties. The Local Arrangements Subcommittee of the Central Medical War Committee will continue its work on lines similar to those it has hitherto pursued. The Ministry of National Service will appoint medical men to visit areas and to advise the Local Medical War Committees and the central professional committees as to the rearrangement of civil practices and the transference of medical practitioners where this may be necessary. The reports of these officers will be made to the Ministry, but they will also be at the disposal of the central professional committees. These officers will attend the meetings of the Local Arrangements Subcommittee, and will, if required, submit to it reports on special areas which they have investigated. Representatives of the Ministry of National Service, the National Insurance Commissioners, and the Local Government Board, and other interested departments, will continue to attend the meetings of the Local Arrangements Subcommittee. A notification was issued by the Ministry of National Service on April 25th with regard to the calling up of older men under the Military Service Act, but it expressly states that it does not apply to medical practitioners, regarding whom special instructions will shortly be issued.

SOME MEDICAL ASPECTS OF AVIATION.

IN a pleasantly written article full of the experience gained at the Royal Naval Air Station, Dunkirk, Staff Surgeon S. F. Dudley,[1] R.N., though he never mentions the word, shows that he has a true insight into the psychology of the fighting aviator. The average flying life of these officers is very short, the wastage being mainly due to invaliding for loss of flying nerve, for they are of little use if they are not, to use their own language, "full out." The strain they are exposed to has manifold sources and falls on most of the senses in ways strange to the human machine with nc heritage of experience in the air; in addition the loneliness, almost amounting to pain, when flying at high altitudes over the enemy's lines, and this is even worse over the sea, the extra work entailed by a spell of fine flying weather, the annoyance, to use a mild term, of anti-aircraft guns of foe and friend, must be taken into account. When, as a result of these and other causes, the pilot begins to calculate his chances and to lose confidence in his machine and his powers, he should be given sufficient leave, and it is essential that this should be managed before there are such definite signs as insomnia and tremor, otherwise he may never return really fit. But as the real aviator is the most courageous of men and, rather than run the risk of a suspicion of "cold feet," will carry on much too long, the medical officers endowed with sympathy and wise tact should be living in intimate contact with the aviators, and so with the help of the squadron commanders be in a position to detect the first signs of staleness and overwork and ensure a real and economical cure. It is not always enough merely to send the strained aviator to England or the country; many of them are colonials without ties or attractions in Great Britain, and to meet their needs a country club with plenty of sporting resources should be established. Leave, too, should be granted as occasion for it arises, and not merely at stated intervals, for in this way many more flying hours of better quality will be secured and a true economy effected. Though on the whole temperate in alcohol, aviators smoke too much, especially cigarettes, and to obviate this habit that of chewing gum, so popular with many colonial officers, might, it is suggested, be more widely encouraged. When a crash occurs the other pilots and observers should be prevented from rushing out, as the sick berth ratings are competent to give first aid, to administer ¼ grain of morphine when necessary, and to convey the patient as rapidly as possible to the hospital. Wounds inflicted in the air usually do well, as infection is less prone to occur than in the trenches, and the pilot should descend at the nearest place where medical care is available and not return to a distant home. No aviator who has had malaria should fly until he has been free from recurrence for six months, for the conditions of chill and fatigue are extremely likely to cause a paroxysm. Many experienced aviators are ignorant of the relief given during and after a rapid descent by auto-insufflation of the Eustachian tubes. Unfortunately some pilots have an unreasonable prejudice against the use of oxygen, possibly bred of some irresponsible scoffer, and medical officers should therefore patiently explain in the mess or in individual talks the value of oxygen at high altitudes in preventing drowsiness and loss of rapid judgement and in accelerating reflex action.

[1] S. F. Dudley. *Journ. Roy. Nav. Med. Service*, 1918, iv. 131-140.

GERMAN INFAMIES.

PROFESSOR GILBERT MURRAY, in his preface to an English translation of the memorandum by Prince Lichnowsky on his period as German Ambassador in London, makes a suggestion to account for the "strange brutalities and ferocities" of the Germans, especially German women, to prisoners captured at an early stage of the war which would save their ethics at the expense of their intelligence. He believes that it was due to their belief that the war was a treacherous attack, plotted in the dark by "revengeful France, barbaric Russia, and envious England." The emperor, the princes, the ministers, the bishops and chaplains, historians and theologians of Germany vied with one another in solemn attestations and ingenious forgeries of evidence, "and the people, docile by training and long indoctrinated to the hatred of England, inevitably believed and passionately exaggerated what they were told." But this explanation does not apply to the deliberate brutalities of the German authorities recorded in the report of Mr. Justice Younger's committee presented to Parliament this week. On February 7th, 1917, the British Government received from the German Government a note dated Berlin, January 24th. It complained that German prisoners suffered from inadequate food, defective accommodation (only tents being provided in many cases), and were subjected to hard work and to irregularities in the matter of their mails. The note went on to state that unless a reply was received from the British Government by February 1st, promising to remedy these alleged hardships, and to take measures to prevent German prisoners being again employed within 30 kilometres of the British front, a number of prisoners of war would be transported from camps in Germany to the area of operations in the western theatre of war, where, in respect of employment, accommodation, food, and mails, they would be treated in a manner corresponding to the practice of the British military authorities. It is now established that British prisoners of war were employed by the German Government within 30 kilometres of the firing line at least as early as July, 1916—that is, at least six months before the German note. An agreement was concluded between the British and the German Governments at the end of April, 1917, not to employ prisoners of war within 30 kilometres of the firing line, but British prisoners were so employed continuously down to, at least, February, 1918. It is also proved that on April 15th, 1917, British prisoners in German hands were told to write home that they would in future be subject to the

following conditions: "Very short of food, bad lighting, bad lodgings, no beds, and hard work beside the German guns, under heavy shell fire. No bed, no soap for washing or shaving, no towels or boots, etc." As early as February, 1917, the German Government had been informed that 75 per cent. of German prisoners in British hands were accommodated in huts, and the remainder, as in the case of very many of the British troops, temporarily in specially warmed tents, provided with floor boards, and an ample supply of blankets. The postal arrangements worked perfectly, and strict orders had been issued that prisoners should not be employed in handling munitions or within range of the enemy's artillery. Only one casualty among them had occurred—a man who was wounded by a shell which must have been fired at exceptionally long range. The evidence is conclusive that the Germans have continuously employed British prisoners close behind their front, and within easy reach of shell fire, in digging trenches, loading munitions, and doing other military work. These men were, and no doubt still are, half starved, the ration for a day consisting of ¼ lb. black bread, with coffee in the morning, soup at midday, and coffee again in the evening. The existence of these prisoners is concealed; they are allowed to write letters on printed forms dated from camps in Germany, but even these letters are not forwarded, and parcels do not reach them. At Limburg-am-Lahn as late as November, 1917, there was an accumulation of between eighteen and twenty thousand parcels for British prisoners on the German western front which had not been delivered. One man who escaped from behind the German lines had weighed thirteen stone when captured; when he got back three months later he weighed eight stone. From a telegram in the *Times* of April 22nd, it appears that the *New York Times* has evidence that similar bad treatment is being meted out to American prisoners. The only ray of light throughout the report is in the evidence of a young wounded British officer in a ward of a German hospital in France. He said that the German university professor in charge of it admitted that he was ashamed of the "frightful" conditions to which his countrymen were subjecting prisoners. "The men were overworked, under shell fire, very much underfed, had not much clothing, and slept in sheds and shelters in the snow—filthy conditions." All were thoroughly ill treated behind the lines, and many died. By subscribing to the Hague Convention of 1907 the German Government entered into certain undertakings, two of which are thus stated in the German war book: (1) "Prisoners of war are protected against unjustifiable severities, ill treatment, and unworthy handling." (2) They "can be put to moderate work proportionate to their position in life. . . . These tasks should not be prejudicial to health nor in any way dishonourable, or such as contribute directly or indirectly to military operations against the Fatherland of the captives."

MEDICAL CERTIFICATES FOR NATIONAL SERVICE MEDICAL BOARDS.

THE Ministry of National Service has recently issued a leaflet to medical practitioners, dealing with certificates for men appearing before National Service Medical Boards. In the first place, it is stated that a well-drawn certificate from a private practitioner may be of great assistance to a Board, and receives full consideration before the Board gives its decision. All such certificates are either copied or filed for reference. A well-drawn certificate from the point of view of the Board is one which states name, age, and address of patient; date of last personal examination; length of time patient has been personally known to certifier; what diseases the latter has attended him for; patient's present physical condition; name, address, and qualifications of certifier. Such a certificate confines itself to matters which have actually come within the practitioner's personal observation and knowledge. If it be wished to draw attention to any other matter, such as the patient's statement about his previous medical history, the fact that it is based upon the patient's statement should be clearly indicated. It is particularly desired that the writer of a certificate should refrain from expressing any opinion as to the man's fitness or unfitness for military service. It appears that many certificates are still handed in to National Service Boards which do not conform to the type of certificate suggested, and even more certificates purport to prejudge a man's fitness or unfitness for military service. The circular ends by quoting from Sir Donald MacAlister's references in his presidential address to the looseness or irrelevance of statements in certain certificates which practitioners profess to attest by their signatures.[1]

MEASLES AND PNEUMONIA IN CHILDREN.

A report has been issued by the Local Government Board on the prevention of mortality and disablement due to measles and pneumonia in children, by Dr. A. Salusbury MacNalty.[2] With regard to measles, Dr. MacNalty has collected and analysed much information bearing on pathology, clinical features, and treatment, on the circumstances determining death from this disease, and on practical measures for rendering it less fatal. This part of the report is prefaced by a memorandum by Dr. S. W. Wheaton, setting out in more detail the administrative measures which should be, and in some instances are being, taken by sanitary authorities against measles by providing for home visiting, adequate nursing, and medical attendance. The second part of Dr. MacNalty's report, on pneumonia in childhood, points to the need for further investigation of deaths from pneumonia complicating measles, for which purpose the information collected and analysed by him would form a useful preliminary. For the reduction of child mortality in pneumonia he believes that reliance must chiefly be placed upon the general measures of preventive medicine, especially those directed towards coping with the problem of infectious diseases, and upon skilled medical and nursing attention. Since bronchopneumonia is the most fatal complication, and the most frequent cause of death in measles, there is considerable advantage in bringing together in a single report the results of investigations, both statistical and clinical, into these two common diseases of childhood.

BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE subscriptions received by the Committee of the Belgian Doctors' and Pharmacists' Relief Fund during the last fortnight, in response to the second appeal, will enable the executive body to resume, though probably not on the original scale, the contributions which have been sent out to the committee of Belgian doctors and pharmacists sitting in Brussels for distribution among those most in need of help. The money received, however, will only restore for two months at most the possibility of sending a large monthly amount to the Brussels committee; hence further support is urgently needed. The anxieties of the present time, the vast increase in taxation, and the steady rise in the cost of living, make this an unpropitious moment for any charitable appeal, but we are sure that the medical and pharmaceutical professions in this country will do all that lies in their power to continue to aid their unfortunate colleagues in stricken Belgium. A much larger sum than has yet been obtained is necessary to make the present appeal a success. The executive committee will welcome regular monthly subscriptions from those who are unable to make a substantial donation; in this way the work could be kept going while time is gained for building up a capital sum.

[1] BRITISH MEDICAL JOURNAL, December 8th, 1917, p. 770, and SUPPLEMENT, December 1st, p. 109.
[2] New Series, No. 115. 1918. H.M. Stationery Office. 1s. 6d. net.

We regret to announce the death on April 21st, at Looe, Cornwall, of Lieutenant-Colonel John Michell Clarke, R.A.M.C.(T.), M.D., F.R.C.P., physician to the Bristol General Hospital, and pro-Vice-Chancellor and Professor of Medicine in the University of Bristol.

Medical Notes in Parliament.

The Budget.

The proposals contained in Mr. Bonar Law's budget speech on April 22nd were very favourably received by the House of Commons. To make good a deficit of 110 millions he proposed increased taxation, which in a full year will, it is estimated, bring in 114 millions. The principle upon which he proceeded was that it was a duty to levy now as much taxation to bear the current expenditure of the war as could be borne by the nation without weakening it in the conduct of the war. Even the Chancellor of the Exchequer was moved by the readiness with which all classes had been prepared to pay.

With regard to indirect taxation, his chief proposal was practically to double the duty on spirits and beer, the actual increase in the case of spirits being rather more than double. From this source he expected in a full year nearly 21 millions. He justified the increase in the duty on tobacco from 6s. 5d. to 8s. 2d. on the ground, firstly, that all persons did not regard it as a necessary of life, and, secondly, that the consumption had increased during the past year in spite of the high rate of the then duty; he hoped to obtain 8 millions from this source in a full year. By an addition to the duty on matches, which would raise the price to 1d. a box, he expected to obtain £600,000. An addition of 11s. 8d. a cwt. on sugar would yield in a full year just over 13 millions. He also proposed to impose a tax of 16 per cent. by way of stamps on luxury expenditure, but as the commodities to be so taxed are to be settled by a special select committee no estimate of the yield was given. The change in the postage rates is expected to yield 4 millions in a full year. For letters the new rate will be 1½d., but this will cover any package up to 4 oz. The lowest rate for parcels will be 6d., but this will carry 3 lb. Inland postcards will now cost 1d. The lowest rate for letters to the troops, to any part of the British Empire, and to the United States of America will be 1½d.; postcards will remain at 1d. With regard to income tax, the rate on unearned income is raised to 6s. in the £, and the estimated yield in a full year is 41 millions. No change is to be made in the existing rates up to £500, nor in the rate on the service pay of soldiers and sailors. The children's allowance will apply also to a wife. The allowance for children up to 16 years of age will apply to incomes up to £800 instead of £700. The super-tax is to be 4s. 6d. instead of 3s. 6d. in the £, and is to begin at incomes of £2,500 instead of £3,000. The estimated yield from this source in a full year is 14 millions. The general effect of the alterations is shown in the following table:

Income Tax.

Income.	Wholly Earned.		Wholly Unearned.		With Super-tax.		
	Amount.	Rate.	Amount.	Rate.	Income	Amount.	Rate.
£	£	s. d.	£	s. d.	£	£	s. d.
550	67	2 5	84	3 1	2,750	868	6 4
700	94	2 8	118	3 4	3,000	962	6 5
1,000	150	3 0	187	3 9	4,000	1,362	6 10
1,500	281	3 9	337	4 6	5,000	1,787	7 2
2,000	450	4 6	525	5 3	6,000	2,237	7 5
2,500	656	5 3	750	6 0	7,000	2,712	7 9

The White Paper containing the estimated cost of Services to be provided for in votes of credit (1918–19) has many points of interest, of which we can only note a few. The vote for the Ministry of Pensions is 41½ millions. Mr. Law said that the total required by the end of the year could not fall far short of 50 millions. The vote for the Ministry of Food is put down at nearly 7 millions. The expenditure on central and local offices is about one million. The total, which includes a sum of 5 millions in respect of potatoes, does not, it is stated, show the whole expenditure of the Ministry. The net expenditure on the Royal Commission on Wheat Supplies is 46 millions; this sum includes a net loss of 40 millions on the sale of the 9d. loaf. The expenditure for the Central Control Board (Liquor Traffic) is estimated at nearly £700,000; of this £16,500 is in connexion with canteens and £647,000 is the net capital expenditure on direct control undertakings, less estimated receipts. The budget of the Ministry of Reconstruction is £26,400. Relief of British prisoners of war and British subjects in enemy countries represents £737,000, and the maintenance of conscientious objectors £116,500. The budget of the Ministry of National Service is nearly 3 millions; nearly the whole, it would appear, is expended in salaries and office expenses. Recruiting and registration are estimated to cost nearly two millions. The estimate for National Service medical assessors, which appears under the Local Government Board, is £7,500. Other expenditure of the Local Government Board is estimated at £95,000.

The Army Medical Service Report.—In reply to Major David Davies, on April 23rd, Mr. Macpherson said no decision had yet been reached with regard to presenting the report of the committee of inquiry into the medical service in France to the House, and that in the present circumstances consideration of the request had been suspended. Sir William Collins inquired whether, in view of the exceptional demands being made on medical men under the new Military Service Act, Mr. Macpherson would not consider the desirability of allowing those interested in the matter to ascertain from this report the way in which medical men were being used at the present time. Mr. Macpherson said he would consider that.

The Medical Profession and the Ministry of Health.—On April 22nd Mr. Booth asked the Minister of Reconstruction whether he had considered the position of the medical profession in relation to the proposed Ministry of Health; what decision had been reached as to a state medical service; and whether it was proposed to decide these matters whilst so many doctors were away serving with the forces? In a written answer Dr. Addison stated that the matter of a state medical service would not have been relevant to the conferences he had held as to the establishment of a Ministry of Health, with, amongst others, representatives of the medical profession.

Medical Examination of Older Recruits.—Mr. Gulland asked, on April 23nd, whether, in view of the necessity of more careful inquiry as to the health of the elder men to be called up under the new Military Service Act, the Minister of National Service would arrange that the opinion of the private medical attendants of called up men should be taken more fully into consideration. Mr. Beck replied that under the instructions issued to medical boards—National Service Regulation No. 24—which had already been published, the boards were directed to give full consideration to medical certificates given by general practitioners or consultants, and he had every reason to believe that this instruction was being fully carried out. The instructions also provided that where necessary reference might be made to the man's usual medical attendant. It was intended to issue further special instructions dealing with the medical examination and grading of the older men.

Prisoners in Turkey.—Mr. Hope stated in the House of Commons, on April 24th, that an agreement with the Turkish Government has been ratified, providing, by a relatively easy medical test, for the repatriation of all invalid combatant prisoners irrespective of rank, and of all members of the medical staff not required for the care of the prisoners who remain. Civilians will also be repatriated subject to certain qualifications. The agreement provides also for the inspection of prison camps by representatives of neutral powers, for better delivery of supplies and correspondence, for sanitation and opportunities for exercise, and for the mitigation of punishment.

Treatment for Discharged Tuberculous Soldiers.—Mr. Duke informed Mr. Nugent, on April 22nd, that a proposal to relax the regulation prohibiting expenditure of the unexpended balance of the capital grant under the National Insurance Act, 1911, as far as might be necessary to provide accommodation in Great Britain for tuberculous men discharged from the army and navy, was under consideration. Any action to be taken in Ireland would be governed by the decision of the Government on the general question.

Medical Treatment of Soldiers' Widows and Children.—In reply to Major Davies, Sir A. Griffith-Boscawen, on April 23rd, said it was not within the competence of Local War Pensions Committees to make general provision for medical advice and treatment of the wives or widows and children of soldiers. Special cases in which there was pecuniary need could be met by grants under the recently extended regulations of the Special Grants Committee, allowing substantial grants extending over a considerable period in cases of serious illness of the wives, children, and dependants of serving soldiers, and the widows and orphans of soldiers deceased.

THE WAR.

TREATMENT OF WOUNDS IN WAR.

THE fourth Inter-Allied Surgical Conference, which met at the French Army Medical School, Val-de-Grâce, from March 11th to 16th, discussed reports upon a number of subjects, and arrived at a number of conclusions. The following is a translation, slightly condensed, of the first section. Translations of others will be published in subsequent issues.

I. TRANSFUSION OF BLOOD.

The results obtained by the transfusion of blood justify its being looked upon as the method of choice in the treatment of serious haemorrhages.

(*a*) *Early.*—The clinical condition of the wounded man affords the main indications for transfusion, and in the advanced posts must alone be depended upon, but additional information may be obtained from repeated observation of the blood pressure, and by red blood cell counts which are of value in wounds of the limbs. In circulatory collapse due to a very acute infection (gas gangrene) no favourable result has been observed after transfusion. The indications for transfusion in the treatment of shock have not yet been sufficiently defined.

(*b*) *Later.*—Corpuscular anaemia after haemorrhage is generally well borne, and does not justify transfusion if the general condition of the wounded man is satisfactory. On the other hand, secondary haemorrhage, diminution in the coagulability of the blood, failure of regeneration of the corpuscles, and chronic infections causing anaemia, may afford indications for transfusion.

Preliminary Precautions.

(*a*) *Risk of Transmission of Diseases.*—Donors should be examined and classified in order to avoid transmission of diseases such as syphilis or malaria.

(*b*) *Incompatibility of Corpuscles.*—Fatal results have been observed in cases in which the corpuscles of the donor were agglutinated by the plasma of the recipient. Such results are rare, and can be completely avoided by agglutination tests which can easily be extemporized. This being so, it is indispensable to examine the agglutination in all cases in which the circumstances render it possible, or to have the donors classified beforehand. At advanced posts it is justifiable to resort to transfusion, even if it be impossible to test the agglutination, as the risk of serious results is relatively small, but it should be tested in all other units.

(*c*) *Asepsis.*—Transfusion should never be undertaken unless an appliance in perfect condition is available and unless strict asepsis is possible.

Method.

The method of transfusion employed should make it possible to measure the quantity of blood transfused. The use of blood which has been preserved for several days has given satisfactory results, and has proved specially valuable in advanced posts during intense military activity. Indirect methods for the transfusion of fresh blood are more easy to employ than vascular anastomosis. The three indirect methods have all given good results—namely, the use of citrated blood, the aspiration of pure blood into an ampoule treated with paraffin, and its aspiration in a syringe. The general principle should be to practise transfusion as early as possible after the receipt of the wound, but it must not be employed until haemorrhage has stopped. In haemorrhage from thoracic or abdominal wounds, or wounds of the limbs, transfusion should be practised either before or during the operation, the time of transfusion depending on the condition of the wounded man.

(To be continued.)

THE EVACUATION OF MEDICAL UNITS IN THE SOMME REVERSE.

THE daily papers of April 22nd contained articles by their representatives at the war correspondents' head quarters in France, describing the withdrawal of the casualty clearing stations during the retirement which began on March 21st. These descriptions resemble each other very closely, and confirm the accounts we were able to publish in the JOURNAL of April 6th and April 13th, but add topographical details which we were not then at liberty to mention. Before the German attack the forward clearing stations were arranged in two tiers or groups. The most advanced were situated at Ham, Cagny, and Noyon in the Fifth Army area, and at Tincourt, Ytres, Grévillers, and Achiet-le-Grand in the Third Army area. The more advanced clearing stations of the Fifth Army felt the pressure first and were evacuated on March 21st. From Ham the patients were evacuated by road to Villers-Carbonnel, but shell fire forced a further move to Amiens, and thence again further back. The clearing stations at Noyon and Cagny were diverted southward to the neighbourhood of Compiègne within the French area. In the Third Army area the clearing stations at Tincourt and Ytres were threatened first, and were sent on the move, followed by that at Grévillers. At Achiet-le-Grand a clearing station was shelled on March 21st, and during its retreat westwards was bombed by German airmen. The units withdrawn to Puchevillers also were bombed by night. Temporary shelter only was afforded to these units in the second line positions at Roye, Maricourt, Dernancourt, and Aveluy in the Ancre valley; thence they moved backwards, for the most part to their present positions. At Roye seventy patients remained behind with a medical officer and twelve orderlies, but were brought away at the last moment by some motor ambulances which chanced to be available; as the last ambulance left it came under rifle fire from the advancing Germans. It is stated that the huts in many instances were destroyed, and the tents either taken away or burned. A great deal of the lighter medical stores and appliances was salved, but a quantity of iron cots, bedding, and heavy disinfecting plant had to be abandoned to the enemy. The surgical instruments seem to have been saved; some were packed on wheeled stretchers, which were pushed along the roads at night by medical officers. According to war establishments every casualty clearing station is equipped for 200 patients; this minimum equipment can be stowed at a pinch in nine motor lorries. On opening up, however, every clearing station has always expanded its accommodation, sometimes seven or eight fold. It appears that the general principle in hurried evacuation has been to reverse this process, sending back first a complete unit of 200 beds, with staff and equipment, which opens up on a new site ahead of the remainder of the station. Thus by the time the later detachments arrive the nucleus of the clearing station is already at work. During the dismantlement of the forward stations the nursing sisters were sent away in motor ambulances or lorries; the casualties among them amounted to one killed and one wounded.

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Killed in Action.

LIEUT.-COLONEL H. STEWART, D.S.O., R.A.M.C.

Lieut.-Colonel Hugh Stewart, D.S.O., R.A.M.C., was killed in action on April 10th. He was born on April 15th, 1881, the elder son of the late Captain Hugh Stewart, of Hatley, Foxrock, County Dublin. He was educated at Trinity College, Dublin, where he graduated M.B., B.Ch., and B.A.O. in 1904. Entering the R.A.M.C. as lieutenant on July 31st, 1905, he became captain on January 31st, 1909, major on October 15th, 1915, and acting lieutenant-colonel on February 1st, 1916. He received the D.S.O. on June 3rd, 1917.

CAPTAIN L. A. H. BULKELEY, R.A.M.C.

Captain Llewellyn Alfred Henry Bulkeley, R.A.M.C., is reported as having been killed in action on April 10th. He was the third son of the Rev. Canon H. J. Bulkeley of Coddington Rectory. He graduated M.B., B.S.Durh. in 1904, and, prior to settling in practice at Gateshead, had served as house-surgeon and house-physician to the Royal Infirmary, Newcastle-upon-Tyne, and house-surgeon to the Darlington Hospital and Dispensary. In 1915 he married a daughter of Dr. James Lawrence of Darlington. He

took a temporary commission in the R.A.M.C. about fifteen months ago, and was promoted to captain on completion of a year's service.

CAPTAIN A. L. GARDNER, R.A.M.C.

Captain Alfred Linton Gardner, R.A.M.C., was killed in action on April 10th, aged 36. He was educated at Guy's Hospital, took the diplomas of M.R.C.S. and L.R.C.P. Lond. in 1912, and, after acting as assistant medical officer of the Poplar and Stepney Sick Asylum, went into practice at Ilfracombe. He took a temporary commission as lieutenant in the R.A.M.C. about two years ago, and was promoted to captain after a year's service.

Died of Wounds.

CAPTAIN J. CARMICHAEL, C.A.M.C.

John Carmichael, M.D., C.M. (Q.U.I.Kingston), Captain C.A.M.C., was born in March, 1889, at Collingwood, Ontario, and received his professional education at Queen's University, Kingston, Ontario, where he graduated in 1915. After acting as resident at the Western Hospital, Toronto, he joined the C.A.M.C. and proceeded to England in March, 1916. He had for two years been attached to the 35th Battalion Canadian Militia, and during his medical course had served as cadet instructor. After two months in England he proceeded to France, becoming attached to No. 2 and subsequently to No. 7 Canadian General Hospital. Later he went to the front as regimental medical officer, and there met his death from multiple wounds on April 5th.

CAPTAIN J. A. MACKENZIE, R.A.M.C.(S.R.).

Captain John A. Mackenzie, R.A.M.C.(S.R.), attached Durham Light Infantry, died of wounds on April 10th, aged 24 years. He was the elder and only surviving son of the late Mr. and Mrs. K. P. Mackenzie, Lochinver, Sutherlandshire. He was educated at Edinburgh University, where he graduated M.B., Ch.B. in 1916, and immediately took a Special Reserve commission.

TEMPORARY CAPTAIN D. MACKINNON, R.A.M.C.

Temporary Captain Duncan Mackinnon, R.A.M.C., died on April 12th of wounds received the same day. He was the youngest son of the late Professor Donald Mackinnon of Edinburgh University, and was educated at that university, where he graduated M.B. and Ch.B. in 1909.

Wounded.

Major R. F. Craig, Australian A.M.C.
Major C. B. Davies, M.C., R.A.M.C. (temporary).
Captain T. G. Allen, Australian A.M.C.
Captain A. Ball, R.A.M.C. (temporary).
Captain A. W. Berry, R.A.M.C. (temporary).
Captain T. F. Corkill, M.C., R.A.M.C.(S.R.).
Captain P. A. Creux, R.A.M.C. (temporary).
Captain E. Dempster, R.A.M.C.(S.R.).
Captain H. F. H. Eberts, R.A.M.C. (temporary).
Captain E. E. Isaac, M.C., R.A.M.C. (temporary).
Captain C. Jacobs, M.C., R.A.M.C.(T.F.).
Captain R. Kenefick, R.A.M.C. (temporary).
Captain P. McLachlan, M.C., R.A.M.C. (temporary).
Captain J. Manuel, M.C., R.A.M.C. (temporary).
Captain A. Merrin, R.A.M.C. (temporary).
Captain B. J. Mullin, M.C., R.A.M.C. (temporary).
Captain H. G. Pesel, R.A.M.C. (temporary).
Captain G. L. Pillans, M.C., R.A.M.C. (temporary).
Captain J. A. Tomb, R.A.M.C.(T.F.).
Captain A. U. Webster, R.A.M.C. (temporary).
Captain W. H. M. White, R.A.M.C.(T.F.).
Lieutenant G. N. Groves, R.A.M.C. (temporary).

Wounded and Missing.

Captain E. E. Mather, R.A.M.C. (temporary).

Missing.

Captain J. G. Anderson, R.A.M.C.(T.F.).
Captain J. B. Ball, R.A.M.C. (temporary).
Captain A. C. Bateman, M.C., R.A.M.C.(S.R.).
Captain A. J. Chillingworth, R.A.M.C. (temporary).
Captain S. J. Darke, M.C., R.A.M.C. (temporary).
Captain R. R. Duncan, R.A.M.C. (temporary).
Captain J. M. Evatt, R.A.M.C.
Captain H. B. Jones, R.A.M.C. (temporary).
Captain R. A. Leembruggen, R.A.M.C. (temporary).
Captain W. H. R. McCarter, R.A.M.C. (temporary).
Captain J. Tate, R.A.M.C. (temporary).
Captain J. P. Thierens, R.A.M.C. (temporary).

Prisoners of War.

Captain T. W. Leighton, R.A.M.C. (temporary).
Captain W. O'Brien, R.A.M.C. (temporary).
Captain D. M. Spring, R.A.M.C. (temporary).

Prisoner of War (formerly reported Missing).

Captain J. C. Muir, R.A.M.C. (temporary).

DEATHS OF SONS OF MEDICAL MEN.

Antill-Pockley, John G., Lieutenant Australian Imperial Force, son of Dr. Antill-Pockley of Sydney, killed March 30th.

Danne, A. W. Bryant, Lieutenant Gloucestershire Regiment, elder son of Dr. Danne of Bristol, killed March 30th.

Edmondson, I. E., Second Lieutenant Army Service Corps, son of Dr. H. Edmondson of Burnley, killed recently by a shell.

Gibbs, David Angus, Second Lieutenant Rifle Brigade, son of the late Dr. Cecil Gibbs, killed March 24th. He was educated at Winchester, got his commission in July, 1917, and went to the front the following month.

Grigson, Sydney Mark, Australian Flying Corps, younger son of Dr. R. C. Grigson of Sydney, died at Central Military Hospital, Aylesbury, April 17th, aged 20.

Smith, J. Noble, Second Lieutenant, youngest son of the late Dr. Noble Smith of Worthing, killed April 9th, aged 19.

Stalker, Daniel, Lieutenant Royal Field Artillery, eldest son of Professor A. M. Stalker of Dundee, died of wounds, April 12th, aged 27. He was educated at Dundee High School, and at Edinburgh University, where he graduated M.A., and became lieutenant on March 19th, 1915.

MEDICAL STUDENT.

Vassie, Richard, Lieutenant Cheshire Regiment, only son of James Arthur Vassie, died at Lanark on April 13th, of illness contracted on active service in France, aged 23. He was educated at Fettes College and at Edinburgh University, where he was a third year medical student at the beginning of the war, when he enlisted in the Scottish Horse. He got his commission in September, 1914, became lieutenant on January 14th, 1915, went to the front in September, 1915, and was invalided a month later.

News has been received by Dr. E. W. Martland that his son, Lieutenant E. N. P. Martland, R.A.M.C., reported missing in last week's JOURNAL, is a prisoner in Germany, and in good health.

In announcing last week the death of Lieutenant Edward J. Gray among the deaths of sons of medical men, it was accidentally assumed that his father, Dr. Alan Gray of Cambridge, was a medical man; Dr. Gray is a doctor of music and the distinguished organist of Trinity College.

[We shall be indebted to relatives of those who are killed in action or die in the war for information which will enable us to make these notes as complete and accurate as possible.]

HONOURS.

THE following medical officers are included in a further list of recipients of the Military Cross, in recognition of conspicuous gallantry and devotion to duty, published in a special Supplement to the *London Gazette* of April 22nd.

Temporary Captain Cecil Francis Dillon-Kelly, R.A.M.C.

Establishing his regimental aid post in the captured enemy line, he himself kept in touch with the advanced troops, and dressed the wounded under heavy machine-gun and rifle fire. He remained in the most advanced positions, dressing the wounded until every case had been evacuated, and showed an excellent example of disregard of danger and courageous determination.

Captain Arthur Joseph Gordon Hunter, R.A.M.C.

His battalion being engaged on both sides of the river at points a considerable distance apart, he repeatedly went out in the face of heavy machine-gun and rifle fire to organize the collection and evacuation of the wounded. His gallant behaviour and magnificent coolness inspired the men working under him with the utmost confidence.

Captain Louis Laurence McKeever, R.A.M.C.

During an engagement, hearing that there was no medical officer in the front line, he at once went forward under an intense bombardment and remained in the front line all night attending to the wounded under continuous and violent shell fire. He set a splendid example of courage and devotion to duty.

A special SUPPLEMENT to the *London Gazette*, dated April 23rd, contains the following records of conspicuous gallantry and devotion to duty for which the decorations announced in the *Gazette* (BRITISH MEDICAL JOURNAL, December 22nd, 1917, p. 839) were conferred:

Bar to the Distinguished Service Order.

Temporary Captain (temporary Lieut.-Colonel) Charles Derwent Pye-Smith, D.S.O., M.C., R.A.M.C.

He was in command of the three field ambulances of the division during ten days' operations. The weather conditions were

abnormally bad and a large number of the wounded of another division had not been evacuated. Owing to his constant presence and influence all the wounded were got away promptly and without assistance from the infantry.

Distinguished Service Order.

Captain William Henry Collins, A.A.M.C.

Finding that his regimental stretcher-bearers were unable to find a regimental aid post which he had established in a German "pill-box," he personally led the first party of them through an intense artillery and machine-gun fire barrage. Although knocked down by a bursting shell, he immediately resumed the dressing of the wounded. Although, owing to casualties, he had only two men to help him, he courageously persevered with his work and himself helped to excavate a dug-out for the wounded under heavy shell fire, during which several of the wounded were killed. He remained on duty for sixty hours and refused to leave his post till the last wounded man had been evacuated. By his constant cheerfulness under the most adverse conditions, and by his utter disregard for his own safety, he kept up the spirits of the wounded and stimulated his surviving helpers to their utmost effort.

Major Eric Lloyd Hutchinson, A.A.M.C.

When in charge of the evacuation of wounded from the forward area he led a relief of stretcher bearers along a track knee-deep in mud, and at times over his waist in water. Another time he led a party through an intense barrage, thus relieving a temporary congestion of the wounded. He had very little rest during the whole four days.

Temporary Captain William Howard Lister, M.C., R.A.M.C.

As bearer officer he took parties to the regimental aid posts, though they suffered heavy casualties on the way. When a regimental medical officer was wounded, he attended to the wounded of this battalion, searching our lines and "No Man's Land" from midday to dark for wounded, and then returned to his field ambulance for another twelve hours' work until relieved.

Major Philip Alan Maplestone, A.A.M.C.

When in charge of all stretcher-bearers and forward posts he showed the utmost coolness under very heavy fire, during which several shelters were hit. By his example he prevented any panic and prevented serious casualties from gas shells. Although gassed himself, he remained on duty till the forenoon of the following day, having been on duty for over thirty hours. Even then he refused to be treated as a casualty, but after a short rest he returned to the advanced dressing station and carried on his duties.

Bar to the Military Cross.

Captain Richard Thompson Caesar, M.C., R.A.M.C.

In evacuating the wounded under very heavy and continuous fire he systematically searched the battlefield from shell hole to shell hole for wounded, until he could report that all casualties had been removed.

Temporary Captain John Maitland Forsyth, M.C., R.A.M.C.

He went up to the front line several times to search for and tend the wounded under heavy shelling and sniping. It was owing to his tireless energy that the casualties, which were very heavy, were so well evacuated. His aid post was twice hit by shells, once causing nine casualties to his bearers.

Captain Cyril Jacobs, M.C., R.A.M.C.(S.R.).

His dressing station, formed under heavy fire, was once blown in on top of him and five casualties occurred, but he remained at his post and managed to evacuate all wounded. On the following day he cleared the battlefield in spite of heavy fire, and brought back twenty badly wounded cases.

Temporary Captain David Henry Russell, M.C., R.A.M.C.

He successfully evacuated a large number of wounded under constant shelling and in very bad weather conditions. He frequently helped to carry wounded, although himself exhausted.

Temporary Captain Philip Randal Woodhouse, M.C., R.A.M.C.

When the battalion was formed up in the assembly area all the battalion medical staff except himself were wounded. He carried the medical haversacks all day and tended the wounded under fire. He was slightly wounded, but continued to work single-handed for two days.

(To be continued.)

FOREIGN DECORATIONS.

The following decorations have been awarded by the President of the French Republic for distinguished services rendered during the course of the campaign:

Légion d'Honneur.—Croix d'Officier: Colonel (temporary Major-General) G. L. Foster, C.B., D.M.S., Canadian Forces. Croix de Chevalier: Colonel G. E. Beauchamp, C.A.M.C.

Croix de Guerre.—Colonel T. Du B. Whaite, C.M.G., A.M.S., Captains J. F. Edmiston, R.A.M.C., J. H. P. Fraser, R.A.M.C., S. R. Gibbs, R.A.M.C. Temporary Captains E. G. Stanley, R.A.M.C., G. T. Cregan, M.C., R.A.M.C. Temporary Lieutenant R. J. Helsby, R.A.M.C.

The King has conferred the Distinguished Service Cross upon Surgeon (acting Staff Surgeon) A. G. Vavasour Elder, R.N.V.R., in recognition of his services in connexion with naval ambulance trains and sea hospital transport throughout the war. Acting Staff Surgeon Elder was frequently under fire at the Gallipoli beaches.

Major Kenneth MacCormick, of the N.Z.M.C., who received the D.S.O. for the services published in the *London Gazette* of April 6th, 1918 (BRITISH MEDICAL JOURNAL, April 13th, p. 440), was incorrectly described as belonging to the C.A.M.C.

NOTES.

TETANUS FOLLOWING INTRAMUSCULAR INJECTION OF QUININE.

THE following report records a sequence of events which has, we believe, very rarely been observed:

Pte. B., aged 24, who was suffering from malaria contracted in Macedonia, received an intramuscular injection of quinine on March 8th, 1918. On March 19th he complained of stiff jaws, and later on of stiff neck. A subcutaneous injection of 8,000 units of antitetanic serum was given. On the morning of March 20th he had frequent tetanic spasms. At 10 a.m. on that day he received 8,000 units of antitetanic serum intramuscularly and 16,000 units intrathecally, followed by 16,000 units intravenously. He died from generalized tetanus at 5.30 p.m. on the same day.

A *post-mortem* examination was made. A saline emulsion of the muscle from the site of the quinine injection failed to induce tetanus in a guinea-pig inoculated with it, but a second guinea-pig, inoculated with a muscle extract of the first animal, developed true tetanus within twenty-four hours. The bacteriologist recovered the tetanus bacillus from the muscles at the site of inoculation in both guinea-pigs, while from the muscle of the patient only a few bacilli were cultivated which morphologically resembled the tetanus bacillus.

CEREBRO-SPINAL FEVER IN THE FRENCH ARMY.

In a paper read recently before the Académie de Médecine, Dopter (*Bull.*, lxxxix, 169-171), who a few months ago published an admirable book on the diagnosis and treatment of cerebro-spinal fever (reviewed on February 23rd, p. 233), gives an encouraging account of the recent incidence of the disease in the French army, and ascribes the improved record to fresh air and the absence of overcrowding. During 1915 there were 1,073 cases, or 4.2 per 10,000; 451 cases, or 1.8 per 10,000, during 1916; and 409, or 1.5 per 10,000, during 1917. He draws attention to a curious change in the bacteriological etiology of the disease during the war; in 1915 the great majority of the cases were due to the meningococcus, type A (Nicolle), but during 1916 the parameningococcus or meningococcus B and C (Nicolle), which before the war was rare, became prominent. The disease becomes more evident towards the end of December, reaches its maximum in March, diminishes to its lowest activity in the autumn, but contrary to its behaviour in pre-war times persists during the summer. The general aspect of the disease is that of an endemic affection with small foci of six to eight cases. During cold weather exacerbations coincide with sudden falls in the temperature, and recruits shortly after their arrival at instructional centres are the most subject, as a result of exposure to cold and fatigue on the journey.

Scotland.

THE OUTLOOK ON TUBERCULOSIS.

SIR ROBERT PHILIP gave his inaugural address as professor of tuberculosis in the University of Edinburgh, in the M'Ewan Hall, on April 16th. In some introductory remarks the principal, Sir Alfred Ewing, said that the University owed the establishment of the new professorship to the Royal Victoria Hospital Tuberculosis Trust. There was no other chair of tuberculosis in the world, and it was eminently fitting that the first should be founded in Edinburgh, as the system of dealing with that fell disease was being copied as the Edinburgh system all over the world. It was satisfactory that the chair was occupied by the man who had created that great organization.

Sir Robert Philip said that the ravages of tuberculosis, though still appalling, had been greatly reduced. From the Registrar-General's figures for 1915 it appeared that in England 54,295 persons died of tuberculosis, representing a death-rate from all forms of 151 per 100,000. In Scotland 7,819 died of tuberculosis, a rate of 163 per 100,000. From pulmonary tuberculosis alone, in England there died 41,676 persons, a death-rate of 116 per 100,000, and in Scotland 5,291 persons, a death-rate of 111 per 100,000. Comparable figures for England twenty-five years ago showed a death-rate of 168 per 100,000, representing a fall of 30.9. In Scotland the death-rate was then 193 per 100,000, so that the fall was 42.4 per cent. This fall was not due to natural causes which had influence in all civilized countries. In 1915 the figures per 100,000 of the population were: Scotland 111, England 116, Germany 142, Ireland 172, France 179. Such facts afforded a striking commentary on the view of Metchnikoff and others that a process of gradual immunization was in progress in thickly populated countries. The fascinating theory of communal immunization on natural lines failed when

tested by facts. The problem of tuberculosis was urgent, and the place occupied by tuberculosis in medicine was large. A return prepared by the registrar of the Edinburgh Royal Infirmary showed that during the year ending January 31st, 1918, some 650 cases, including tuberculosis of practically every organ and structure of the body, were treated within the wards. The list did not include out-patients, and the numbers were the more remarkable inasmuch as the Royal Infirmary was a general hospital, which in principle excluded infective conditions. He considered the prospect for the future full of hope. No disease was more tractable if its character were recognized sufficiently early. Nature cured tuberculosis every day. The treatment of tuberculosis had been revolutionized by the recognition of the principle of aerotherapy, and by fulfilment of physiological demands for rest, movement, and feeding. In the adaptation of aerotherapy to the prevention and treatment of disease there existed the potential of successes comparable with those obtained in surgery through the practice of aseptic methods. After discussing the possibilities of vaccine-therapy and chemotherapy, the lecturer spoke of the prevention of the disease. The war had only made more evident the urgent need for a wisely directed comprehensive campaign against tuberculosis. There were indications in some parts of the country of an increase in the death-rate from tuberculosis; the conflict was with an aggressive infection having immense ramifications, whose ravages could be checked only by unremitting effort on approved lines. One encouraging fact was that the British armies had suffered less than those of continental powers. In conclusion, he spoke of the need for training in the prevention and treatment of tuberculosis.

THE PHYSICAL WELFARE OF MOTHERS AND CHILDREN.

The reports issued by the Carnegie United Kingdom Trustees on the existing provisions for promoting the physical welfare of mothers and young children in England and Wales and in Ireland have already been reviewed in the columns of the JOURNAL. A third volume deals with Scotland.[1] The introduction by the Secretary of the Carnegie Trust emphasizes the importance of this work of collective investigation and report, because the rate of infantile mortality and its predominant causes, as well as the health supervision of children from infancy to the age of admission to school, are among the most important problems of the present day.

In preparing this report and survey of medical, statistical, social, and administrative materials, Dr. W. Leslie Mackenzie has tried to preserve freshness of outlook on the facts. Investigators visited the places under review, made notes of their inspections, interviewed officials, obtained from them directly such relevant printed or written matter as was readily available, and received verbally much valuable direction in a very complicated inquiry. By these means first-hand records were made of living experience—much that rarely finds its way into print. The effect has been to produce a book brimful of the most absorbing human interest and a record of the highest value to social workers of whatever grade.

One of the most interesting features of the report is that dealing with the distribution of the population. For the most part the people congregate along certain valley and coast lines and are but thinly scattered over the mountainous regions. In some of these valleys great cities have sprung up within recent years owing to the expansion of certain industries. There are steel cities and coal cities. The problems of life in these regions of widely different character require separate treatment. Even in the towns there are differences; the older towns or burghs have an established life of their own, very different from the life in the vast new industrial areas with their special problems of massed humanity. The report deals very illuminatingly with these different conditions and the special means adopted to meet their problems. Then there are parts of the land, in the highlands and islands, where life is at an almost primitive level, where are to be seen dwellings but little removed from prehistoric huts; the excellent photographs reproduced in the book would suggest some distant clime were it not for the clothing of the people about the places. The diversity of the problems connected with maternity under such varying conditions may be illustrated by two examples. Writing from Dundee Miss Mary Paterson says:

> As a result of my inquiry I feel convinced that mothers and children would both benefit if the period of absence from the mill after childbirth were extended. An amendment of the Act making a three months' absence compulsory now, the period of absence to be extended further at a future date, would give the child a chance which it does not seem to have now, and would no doubt result in the more general (and more wise system of) nursing by the mothers. Many women have to leave the mill some time before childbirth because their work fails to come up to the required standard, and this is often a blessing to them, little though they realize it. Compulsory absence would, I am assured, lessen the sufferings of the women and reduce the number of stillbirths, but the difficulty of enforcing the law would, of course, be great, and the responsibility necessarily rest on the woman herself.

Amongst the special studies recorded is a report of life in a Shetland island:

> There a woman usually goes about her ordinary work up to the time of her confinement. At the first sign of labour coming on the midwife is sent for post haste. The patient goes to bed and remains there till, at the earliest, the "ninth day." Formerly it used to be thought dangerous to wash the patient at all after childbirth, any old pieces of cloth were thought to be good enough to use for absorbing discharges, and I often wonder how the poor women ever got well again. Up till quite recently the poor woman was practically starved for four or five days, but now a more common-sense view is taken and proper nourishment allowed. The infant spends most of the first two years of its life in a cradle, generally made of wood, with a wooden hood absolutely wind-proof. There is seldom any regularity observed in feeding; a cry is a sign that the child wants food, and, in consequence, the child is constantly overflowing. Old wives still have great influence in these undiscovered territories.

[1] *Scottish Mothers and Children.* Being Report on the Physical Welfare of Mothers and Children, Scotland. By W. Leslie Mackenzie, Medical Member of the Local Government Board for Scotland. The Carnegie United Kingdom Trust, East Port, Dunfermline. 1917. (8vo, pp. xxvii + 632.)

Correspondence.

BOTULISM.

SIR,—Professor Arthur J. Hall's letter on botulism in the JOURNAL of April 20th (p. 467) is of special interest at the present time. The clinical picture presented by the Sheffield cases appears closely to resemble that of the classic accounts given of this very rare disease. Assuming that they are cases of true botulism and due to the ingestion of specifically infected food, it is of the first importance that the food at fault should be identified either by discovering the *B. botulinus* in portions of some of the material actually eaten by the patient, or by the method familiar to epidemiologists of finding in a detailed and exhaustive food history of a group of cases some food material which is not only common to, but in a certain degree peculiar to, them all.

In order that one or other of these methods of investigation may be applied at the earliest moment, while there is still a chance of obtaining a portion remaining over from any suspected food eaten, and while the memory of the patient or his friends is still fresh as to the foods recently consumed, it would be desirable for medical practitioners to communicate at once with the medical officer of health of their district when any suspicious case comes under their observation.

I shall be glad if medical officers of health who may have had such cases brought to their notice will send me as full particulars, especially as regards food history, as they can obtain. I will arrange to have examined for them any samples of food materials which they may have good reason to suspect of having given rise to this illness.—I am, etc.,

A. W. J. MACFADDEN.

Local Government Board,
Whitehall, S.W.1,
April 23rd, 1918.

THE VALUE OF THE WASSERMANN TEST.

SIR,—The memorandum by Dr. J. S. Robertson in your issue of April 13th, p. 427, is a typical example of a little knowledge being dangerous. He states that "the Wassermann test carried out in the usual way is useless," and in support of this far-reaching assertion what is his evidence? First, that in a pregnant woman with obvious syphilis the test was negative. Even the most inexperienced should know that this is the usual result, but

that after labour the test may be positive, and no pathologist would attach any importance to a negative test obtained during pregnancy. Second, that patients with obvious syphilis were declared to have a negative Wassermann, or that different results were obtained from the same case in different institutions, or even by the same worker. The obvious reply to this is either that the diagnosis was wrong—and even clinicians may err—that the blood was sent at an unsuitable time—for example, during treatment—or that the methods in doing the test were not properly carried out. As to the question of diagnosis, one has known clinicians of even lock hospitals to be wrong about "obvious syphilis," and, if the pathologist were as unscientific as the writer of the memorandum, he might say "my Wassermann tests show how fallacious is the diagnosis of syphilis by Dr. Robertson," or even the well-known surgeon to whom he refers.

The pathologist, however, does not assert this, because as one trained in scientific scepticism he looks at all the evidence, and is not prepared to say that a negative Wassermann test is absolute proof of the absence of syphilis; and further, he knows only too well that a test of this kind must be carried out with the greatest care and with all reagents properly standardized, and that the results must be interpreted by experienced workers. That these conditions are not always, or one might say even generally, fulfilled is also an obvious fact. When a test is being made in a chemical laboratory, the solutions used are standardized, all measurements are made with the greatest accuracy, and if the result is not what was expected, the worker generally asks, "Where did I go wrong?" but with the Wassermann reaction—a chemical test—the standardization of reagents and accurate measurements are too often ignored, and when the result turns out to be different from that expected then we are told, not that the work done but that the test itself is useless.

As I have said, I am not prepared to say that the test is infallible in the diagnosis of syphilis, but I am sure I voice the opinion of most experienced workers when I say that it is of extreme value in diagnosis, and in estimating the result of treatment, if it is carried out properly and with due consideration of the time after treatment at which the test is made, etc. Personally I feel that no case should be declared free with less than two negative reactions—one, one month, and the second three months after the cessation of all forms of treatment. Too often I have seen cases declared cured after a course of treatment, either without a test or with a negative result a few days after the last injection, with the result that a valuable aid to diagnosis—for I regard the test as an aid to, and not a substitute for, clinical diagnosis—is regarded as useless.—I am, etc.,

J. M. BEATTIE, M.D.,
Professor of Bacteriology.

University of Liverpool,
April 23rd.

ACUTE YELLOW ATROPHY IN SYPHILIS.

SIR,—In regard to Dr. Nathan Raw's memorandum in the JOURNAL of April 20th, p. 454, I should like to point out that acute yellow atrophy of the liver ("acute atrophy" or "subacute atrophy" are preferable terms) was well known as an occasional complication of syphilis before the days of the arsenical treatment by salvarsan, etc. In the *Proceedings* of the Royal Society of Medicine for 1909 (Pathological Section, vol. ii, pp. 113–122) I described such a case, and endeavoured to give a summary of the already at that time very considerable literature on the subject. The acute hepatic atrophy seems in most cases to have occurred during the late primary or early secondary stages, like acute syphilitic meningo-encephalo-myelitis. Since the introduction of treatment by salvarsan, etc., both precocious syphilis of the nervous system and precocious hepatic symptoms have frequently been ascribed to the action of the arsenical treatment. The probability appears to be that in exceptional individuals the treatment in question does really favour the onset of such serious, and often fatal, complications.—I am, etc.,

F. PARKES WEBER, M.D.

London, W., April 20th.

DEFECTIVE UTILIZATION OF MEDICAL MEN IN HOME COMMANDS.

SIR,—In your comments upon the position of the medical profession under the new Act you express a doubt whether the available material is always utilized to the best advantage. May I call attention to one direction in which this doubt seems justified?

Surgeons and physicians still engaged in active practice are employed to visit and inspect hospitals in the various commands. Their names carry prestige, but it is manifest that in occasional short inspections questions of actual practice cannot be dealt with, and all that the inspection can effect is to see that accommodation and general administration are satisfactory or otherwise. This could be quite as efficiently done by medical men whose time of usefulness in a purely medical capacity has gone by, but who have devoted some of their years of leisure to hospital administration. There are many such who would gladly undertake this work.—I am, etc.,

F.R.C.S.

April 22nd.

FUNCTIONAL HEART DISEASE AND RECRUITING.

SIR,—As a member of a medical board I have been much impressed with the large number of young men brought up for examination who exhibit a very definite form of functional heart disease, for which in some instances they have previously been "deferred." These youths exhibit a syndrome of three well-marked signs which I have observed for some twenty years or more to be invariably associated with a certain vicious habit. I have seen scores of such cases, and have never once been mistaken in the diagnosis since first learning to recognize the three signs. Sometimes the youth, when first accused, denies the practice; but when the examiner says to him, "I am not asking you, I am telling you; do you practise it now?" he almost invariably acknowledges it, but adds that he gave it up some weeks or months ago. The habit referred to is masturbation. The following signs constitute the syndrome:

1. Widely dilated pupils. This sign in a young man who is not suffering from marked anaemia should at once raise in the mind of the examiner the suspicion of masturbation as the cause.

2. The examiner then places his hand over the heart to feel the apex beat. In these cases the beat is felt to be markedly accentuated, giving the impression of a thin-walled ventricle. The beat is short and sharp, and in the normal position.

3. The pulse, which one might expect from the character of the heart's action to be full and fairly strong, is small and very compressible. Its rate is little, if any, beyond the normal.

The contention is that large pupils, marked accentuation of the cardiac impulse, and a small compressible pulse, form a syndrome which is the result of the above-mentioned vicious habit, and which, when seen in the same individual, are pathognomonic of the condition.

The hints given in textbooks as to the indications of this habit are, in my experience, quite unreliable, and a recent article on masturbation in a leading medical periodical is also, from the point of view of diagnosis, absolutely valueless.

As regards the "grading" of these men, there is no necessity to "defer" them, or to place them in a low category, if they are otherwise quite sound; indeed, the graduated training will be so beneficial that I never hesitate to place them in Grade I.—I am, etc.,

H. DRINKWATER.

Wrexham, April 22nd.

THE National Health Society, which during the forty years of its existence has done much excellent work, especially in instructing women in hygiene and preparing some of them to hold public appointments under local authorities, is making an appeal for £5,000 to provide small bursaries for suitable candidates during their period of training. Full particulars of the objects of the fund and of the courses arranged for women desirous of becoming sanitary inspectors, health visitors, superintendents of infant welfare centres, and factory inspectors, can be obtained from the secretary, Miss Lankester, 53, Berners Street, London, W.1. The appointments of sanitary inspector (Kensington and Lewisham), superintendent of infant welfare centre (Lambeth), and health visitor (Blackburn) have recently been obtained by students of the society.

Obituary.

C. F. M. ALTHORP, M.B.LOND.,

Senior Surgeon to the Bradford Royal Infirmary.

WE regret to announce the death of Dr. Charles Frederick M. Althorp of Bradford, which took place at his residence on April 8th. Dr. Althorp was a native of Bradford and was educated at the Grammar School and at the Leeds School of Medicine. He took M.R.C.S. and L.R.C.P. diplomas in 1887 and the M.B.Lond. degree in 1891. After qualifying, he held resident posts at the Leeds General Infirmary and the Bradford Royal Infirmary. At the latter he remained two and a half years, resigning his post to be appointed one of the first assistant surgeons to that institution. He became full surgeon in 1898, remaining in office until a short time before his death, when he tendered his resignation on account of ill health. When the St. Luke's (Bradford) War Hospital was established Dr. Althorp accepted an appointment as one of the visiting surgeons, continuing to act until a few weeks ago. His work for the war also included the medical officership of the "Bradford Pals" Battalion, the 16th and 18th W. Yorks, during their training in Bradford. Dr. Althorp was a consistent supporter of the British Medical Association, and for some years occupied a seat upon the Ethical Committee of the Bradford Division. His chief interest, however, lay in the affairs of the Bradford Medico-Chirurgical Society, and he was a regular contributor to its proceedings of papers of great surgical interest, as well as being a frequent participant in the scientific discussions. He served the society for some years as an energetic and enthusiastic secretary; was president in the session 1904–5, and long acted as honorary librarian.

In 1916 a serious breakdown in health laid him aside for nine months, but he returned pluckily to work, and his last visit to the War Hospital was the last occasion upon which he left his house. His death is mourned by hosts of friends in the profession and amongst his hospital and private patients. Modest and retiring to a fault, he was a generous colleague, a loyal friend, and a sound surgeon.

GEORGE ROWELL, F.R.C.S.ENG.,

Anaesthetist, Guy's Hospital.

WE regret to record the death of Mr. George Rowell, senior anaesthetist to Guy's Hospital and president of the Section of Anaesthetics of the Royal Society of Medicine. Mr. Rowell received his medical education at Guy's Hospital, and obtained the M.R.C.S. and L.R.C.P. in 1886, and the F.R.C.S. two years later. His former appointments included those of anaesthetist to the Royal Dental Hospital, the West End Hospital for Nervous Diseases, and the Royal Orthopaedic Hospital, and since the war he had served as honorary anaesthetist to the King George Hospital and to the Royal Flying Corps Hospital. In 1891 the Council of the British Medical Association appointed a special committee to investigate the clinical evidence with regard to the effects of anaesthetics upon the human subject, and especially the relative safety of the various anaesthetics, the best methods of administering them, and the best methods of restoring a patient in case of threatened death, and Mr. Rowell was appointed honorary assistant secretary. Ten years later he was member of the Special Chloroform Committee appointed by the Council of the Association to investigate methods of quantitatively determining the presence of chloroform in the air and in the living body. In addition to his work on these committees, Mr. Rowell contributed a number of practical papers on anaesthesia to medical periodicals.

We are indebted to Sir W. ARBUTHNOT LANE for the following appreciation:

George Rowell, who died on April 17th at the age of 54, occupied for many years a very prominent and respected position in the anaesthetic world. He held many appointments, the chief being that of senior anaesthetist and lecturer on anaesthetics at Guy's Hospital. He was an excellent teacher, and was most popular with the students; the care and attention which he gave to their instruction have proved most useful to them in practice. As an anaesthetist he was perfect. He inspired his patient with absolute confidence, while the surgeon knew that he could rely implicitly on his skill and judgement, which, within the recollection of his friends, were never known to fail in a single instance. He was one of the first to recognize the value of open ether, which he advocated very strongly when he held the post of joint secretary to the British Medical Association's commission on chloroform anaesthesia. Since the commencement of the war he has given his services freely to several voluntary hospitals, and it is largely due to the excessive strain which this additional work entailed that his vitality was so lowered as to render him unable to withstand the infection from which he died, and which he may well have acquired in the performance of his professional duties. He was one of the most warm-hearted, generous, and loyal men one could ever meet, and the name and recollection of George Rowell will always occupy a very warm and cherished spot in the hearts and memories of a much larger circle of friends than it is given to most men to enjoy. Their devotion to him was truly remarkable, and it will ever be a matter of regret to them that he did not better employ his exceptional abilities to his own personal advancement. He leaves behind a most loyal and devoted wife and son, to whom his loss is irreparable.

DR. EDWARD THOMAS WILSON, for many years one of the leading physicians of Cheltenham, died on April 19th, at the age of 85. He studied medicine in the University of Oxford, where he gained first class honours in natural science, and at St. George's Hospital. He obtained the M.B. degree in 1858, and became M.R.C.P. in 1860 and F.R.C.P. in 1870. His connexion with the Cheltenham General Hospital, which he served as physician for thirty-one years, began with his appointment to the medical staff of the branch dispensary nearly sixty years ago. He was also for many years medical officer to Cheltenham College, to the Cheltenham Ladies' College and Dean Close School, and consulting physician to Winchmore Cottage Hospital and the Cotswolds Convalescent Home. At the annual meeting of the British Medical Association at Nottingham in 1892 he was vice-president of the Section of Public Medicine; and nine years later, when the annual meeting was held at Cheltenham, he was president of the Section of Medicine. Dr. Wilson published a number of papers on infectious disease, and was the author of Sanitary Statistics of Cheltenham, of which the first series was published in 1865, and the second in 1872. In former days he was a keen microscopist, and served as president of the Cheltenham Natural Science Society. He was a brother of Major-General Sir Charles Wilson, who went up the Nile to open up communication with Gordon at Khartoum; and one of his sons was the late Dr. Edward Adrian Wilson (head of the scientific staff of the national Antarctic expedition, 1910), who perished heroically with Captain Scott on the return journey from the South Pole.

DR. M. PROSSER JAMES, who died recently at his residence in North Kensington, aged 82, was in former years well known in laryngological circles. He received his medical education at the London Hospital, and took the diplomas of M.R.C.S. in 1856, L.S.A. in 1857, and M.R.C.P. in 1867. He graduated M.D.St. Andrews in 1857. He was consulting physician to the Children's Home Infirmary, Victoria Park, and had been physician to the Hospital for Diseases of the Throat, Golden Square, and to the North London Consumption Hospital, and lectured on forensic medicine and therapeutics at the London Hospital. He was a corresponding member of the Academies of Medicine of Madrid and Lyons, and was the author of several books on diseases of the throat and nose, and also on climatology and therapeutic mineral waters. He was one of the founders, in 1887, of the British Laryngological and Rhinological Society, and was one of the earliest workers with the laryngoscope and rhinoscope. For many years Dr. Prosser James took a deep interest in the affairs of the Western Skin Hospital, of which he was honorary treasurer, and he was a strong supporter of the Hamilton Association for trained male nurses. In 1875 he had a severe attack of rheumatic fever, and for the remainder of his life was unable to walk. Throughout this invalid existence he found solace in his library, where he indulged his strong literary taste and love of reading.

The death, on April 8th, of Dr. Robert Stevenson of Bootle, came as a shock to many of his friends. He died after a few days' illness, from acute pneumonia, at the age of 56. He was born in Scotland, graduated M.B., C.M. Glas. in 1887, and became M.D. in 1897. He had been in practice at Bootle for over twenty years; he became a member of the Liverpool Medical Institution in 1901, and was an active member of the Council in 1917. Dr. Stevenson held many public appointments, and was honorary anaesthetist to the David Lewis Northern Hospital, Liverpool. He was held in high regard by his fellow townsmen; to a native shrewdness he added painstaking skill, and was in consequence a busy practitioner. Of a somewhat retiring disposition, he took no prominent part in public affairs, but secured the esteem of his professional brethren and a large circle of friends. The funeral took place on April 11th at Bootle Cemetery. A large number of friends and representatives of the institutions to which he acted as medical officer were present to testify to the sterling merit of Dr. Stevenson. He leaves a widow to mourn his loss, and many Bootle residents to cherish his memory.

We regret to announce the sudden death, on March 24th, of Dr. H. Aldersmith, formerly medical officer to Christ's Hospital, first of all when it was still in the City of London, and afterwards when it was removed to Horsham. Dr. Aldersmith studied medicine at St. Bartholomew's Hospital, obtained the M.R.C.S. diploma in 1870, and the fellowship two years later, and graduated M.B.Lond. in 1875, obtaining the university scholarship and gold medal. He also won the gold medal of the Apothecaries' Society, and a senior scholarship at St. Bartholomew's Hospital, where he held the appointments of house-surgeon and house-physician. Dr. Aldersmith was the author of a small work on ringworm and alopecia, which reached its fourth edition in 1897. He took a deep interest in the welfare of the Horsham Cottage Hospital, of which he was honorary secretary.

Dr. Vernon Harold Starr, Church Missionary Society, was stabbed by a fanatic at Peshawar on March 17th, and died twelve hours later, aged 35. He was the son of the late Mr. H. P. Starr, and was educated at King's College Hospital, London, graduating M.B. and B.S.Lond. in 1908. After acting first as assistant and then as senior house-surgeon of the Royal Devon and Exeter Hospital, he went to Peshawar in 1910 as surgeon in charge of the Church Missionary Society's mission hospital in that city.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

The following candidates have been approved in both parts of the examination in Sanitary Science: D. W. Boswell, Edna M. Goffe,* J. L. Gregory, May I. T. Reid, A. J. H. Russell,* Jane Stalker, E. J. Tyrrell.

*Distinguished in bacteriology.

Medical News.

The late Sir James Alexander Russell, M.D., of Edinburgh, left £33,766 gross.

Surgeon-General Sir Arthur W. May, R.N., K.C.B., has been appointed a deputy lieutenant of the county of Cornwall.

Dr. Edward Buxton, M.D., F.R.C.S.E., J.P., has been unanimously elected chairman of the Great Crosby Urban District Council for the ensuing year.

Dr. Sidney Matthews (Crawley) has been added to the Commission of the Peace for Sussex.

Dr. Donald Murray, M.O.H. for Stornoway, has been adopted as the prospective candidate for the representation in Parliament of the Western Isles.

At a meeting of the Central Midwives Board on April 18th Sir Francis Champneys was unanimously re-elected chairman. Fifteen midwives were removed from the roll on their own application.

A proclamation has been issued under the new Military Service Act cancelling as from April 24th all exemptions granted by tribunals or Government departments to men between 19 and 23 in grades 1 and 2, or categories A, B 1, B 2, and C 1, with certain exceptions, which include duly qualified medical practitioners.

Dr. J. M. H. MacLeod will give a course of demonstrations on skin diseases, especially those met with in military wards, at Charing Cross Hospital on Tuesdays, at 3 p.m., commencing on Tuesday, May 7th. The demonstrations are open to all medical practitioners and medical students.

A series of lectures and demonstrations on the feeding and care of infants will be given by Dr. Truby King, C.M.G., in the Governors' Hall, St. Thomas's Hospital, on Tuesdays and Fridays. Sir Arthur Stanley will take the chair at the first lecture at 5.30 p.m. on Friday, May 3rd. Members of the medical profession, nurses, and infant welfare workers can obtain tickets from the secretary of the hospital.

Dr. Chauveau, representative of the Côte-d'Or, has been elected chairman of the French parliamentary group by thirty-one out of thirty-four votes. In thanking the members for the honour done him, Dr. Chauveau pleaded for a closer union between the group and the medical press and professional associations so that parliament might be kept in touch with the profession.

Columbia University has received £10,000 from an association of medical women, and contributions from other donors amounting to £3,600, to enable it to begin the erection of buildings in the medical department for the accommodation of women students. The university has lately received a gift of £600 from an anonymous donor for research in war problems, and another of £1,000 from Mr. Clarence Mackay for surgical research work.

A meeting of medical men, jurists, and philanthropists representing every part of Switzerland has been held to discuss the formation of a Swiss association for the prevention of venereal disease. Professor Bloch, director of the dermatological clinic of the University of Zürich, and Colonel Hauser, head of the medical service of the Swiss army, were appointed to draw up reports on the campaign against syphilis in the civil population and in the army.

Dr. Francisco Dominguez Roldan, who was recently appointed secretary of Public Instruction and the Fine Arts, one of the highest administrative posts in the Republic of Cuba, is a distinguished member of the medical profession. After graduating at the University of Havana he studied for a long time in Paris, devoting himself especially to anatomy. On his return to his native island he was appointed professor in the University of Havana, and won a great reputation and influence as a teacher.

The London County Council, at its meeting on April 23rd, agreed to the establishment for one year of an experimental centre for remedial exercises as part of the Council's scheme for the medical treatment of school children. The treatment is intended for the more pronounced cases of such deformities as lateral curvature of the spine, and a voluntary committee is to manage the centre, which will be in Hampstead, where selected children from schools in the district will be sent for treatment.

At a meeting of the National Baby Week Council on April 11th, under the chairmanship of Sir James Boyton, M.P., it was announced by Dr. Eric Pritchard, chairman of the executive committee, that this year the national celebration would be held from July 1st to 7th, but local committees would be free to choose dates to suit their own convenience. Exhibitions of the practical side of infants' welfare work and mothercraft competitions would be held. It was agreed to co-operate with the National League for Health, Maternity, and Child Welfare. The offices of the National Baby Week Council are at 27A, Cavendish Square, London, W.1.

Disturbances of the reactions of the pupils after recent shell shock without external wounds are probably common, but, as vision is not affected, little attention has been called to the subject. From an analysis of twenty-six cases, Guillain and Barré (*Ann. de méd.*, 1917, v, 503-513) find that the following changes may occur: Dilatation, without reaction to light or accommodation; inequality, with failure to react to light on one or both sides; inequality only; the Argyll Robertson pupil; and the paradoxical reaction to light. As a rule, these disorders do not last more than three weeks. The explanation of the pupillary abnormalities is difficult; there is no gross damage to the eye, and there is no evidence that they are hysterical. In six of the cases examined the cerebro-spinal fluid was yellow as the result of haemorrhage; possibly in these cases there was a toxin which acted on the roots of cranial nerves or on the fibres of the pupil reflex; possibly the shock affected the retina or the ciliary nerves and muscle, causing asthenia; or possibly there was local compression by blood clot, but in most of the cases there was no sign of meningeal haemorrhage.

Letters, Notes, and Answers.

The telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2631, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediscera, Westrand, London*; telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

The address of the Central Medical War Committee for England and Wales is 429, Strand, London, W.C.2; that of the Reference Committee of the Royal Colleges in London is the Examination Hall, 8, Queen Square, Bloomsbury, W.C.1; and that of the Scottish Medical Service Emergency Committee is Royal College of Physicians, Edinburgh.

LETTERS NOTES, ETC.

PART-TIME MEDICAL OFFICERS OF HEALTH.

MEDICUS, in reply to Dr. Lemarchand (p. 360), points out that a doctor may gain or may lose by entering public life, or by holding public appointments. He maintains that if a general practitioner is to be excluded from part-time medical officership of health by reason of the advantage it might give him over his colleagues in private practice, he should equally be excluded from other part-time appointments, such as hospital posts, factory surgeonships, etc., and even from taking an active part in municipal or church life.

A CASTOR OIL DRESSING FOR WOUNDS.

DR. JOHN WISHART (Newcastle-on-Tyne) recommends the following method of dressing wounds, which he has used since 1904. He employs castor oil 2 ounces, anaesthetic ether 2 ounces, liq. iodi fort. 1 drachm, and then applies white lint soaked in castor oil. The wounds done in this way only require dressing once weekly, and there are none of the sticking troubles which one has to face in removing gauzes. In circumcision wounds, and ordinary incised and contused wounds, the redressing causes no pain.

VAGINAL DOUCHING.

DR. HENRY DUTCH (London, W.) writes with reference to Dr. W. E. Fothergill's paper (p. 445) on vaginal douching: I have long since recognized the futility of this procedure, which I agree frequently aggravates the condition. The presence of vaginal discharges is very annoying to the patient. Some years ago I suggested a "vaginal applicator," something after the style of Kelly's rectal speculum. This instrument is passed into the vagina by the patient, and a long swab-holder is passed through the speculum, which, gently rotated, brings away any discharge present. I frequently order the swab to be moistened with hydrogen peroxide, which cleans and helps to collect the discharge. It is obvious that something must be done locally to relieve the condition and the patient's mind. The instrument has been made for me by Allen and Hanburys.

TUBERCULIN TREATMENT OF PULMONARY TUBERCULOSIS.

DR. ADAM MOSS (West Kirby) writes, with reference to Dr. A. E. Prest's note (p. 444) commending rest in the treatment of early cases of pulmonary tuberculosis, to state that he treats such cases with tuberculin and lets them go about, and obtains a cure in practically every one. Even in comparatively advanced cases, he continues, with temperature of 100° or 101°, I do not insist on absolute rest. They come to me twice weekly for injections, and rest as much and exercise as much as they feel inclined. Three years ago a man came to me from a sanatorium, which he had entered eight months before as a very early case. His temperature was 101° and the disease so far advanced that I thought it was hopeless to expect a cure. In six months the temperature was normal, and at the end of twelve months I had worked up his dose to 1 c.cm. of old tuberculin. He was then without cough or expectoration and physically absolutely fit. He has done his full work for eighteen months without a day's illness. By all means let the leaders of the profession lay aside prejudice and the rank and file learn how to use tuberculin. I follow Dr. Camac Wilkinson's method and I am more than satisfied.

BRANCH SECRETARIES IN THE BRITISH MEDICAL ASSOCIATION.

SURGEON-GENERAL GEORGE J. H. EVATT, M.D., C.B. (Junior United Service Club, London, S.W.), writes: In view of the difficulty that often exists in getting an effective local secretary for a Branch, may I submit the following suggestion? I propose that *several* Branches should agree to employ jointly a *paid* secretary, who, living anywhere within the Branch districts, could attend all Branch meetings, and do the secretarial work for all. From secretaries so trained a general secretary might one day be chosen for the British Medical Association. From time to time medical men retire from official medical services with pensions. Such persons, not too old, could well be chosen as joint secretaries of united Branches, and they would, I believe, contribute to the local efficiency of the British Medical Association.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

IT was decided at the last meeting of the Executive Committee of the Fund that a second appeal must be made to the medical profession on behalf of our suffering Belgian colleagues, their wives and families. A statement has been widely circulated during the week showing directions in which the large sum contributed to the Fund by the generosity of the medical and pharmaceutical professions has been distributed, and giving also the reasons why every endeavour must be made to maintain the Fund in all its great sphere of utility.

In response to the circular, Dr. H. A. Des Vœux, the treasurer, is now receiving a large number of subscriptions, so large that only a portion of them can be acknowledged in our columns this week.

Subscriptions to the Second Appeal.

The following subscriptions to the Fund have been received during the week ending April 15th:

	£	s.	d.
Lieut.-Col. G. H. Mott, I.M.S.	5	0	0
Dr. John H. Teacher	2	2	0
Sir Kennedy Dalziel, M.B.	5	5	0
Dr. Frank Boxall	1	1	0
Mr. R. R. James	1	1	0
Dr. John Hamilton	1	1	0
Dr. Bannerman	1	1	0
Dr. Watson-Williams	6	6	0
Dr. Clifford Beale	5	5	0
Dr. Abraham Cohen	1	1	0
Dr. Cecil E. Salt	1	1	0
Dr. Thomas Procter	0	10	0
Dr. Jane H. Turnbull and Dr. Louisa Hamilton	2	2	0
Dr. George Bate	1	1	0
Dr. E. M. Goldie	1	1	0
Dr. H. L. Hatch	1	1	0
Mr. E. Treacher Collins	3	3	0
Dr. Beckett-Overy	5	0	0
Dr. Hamilton Bland	10	10	0
Dr. Violet Coghill	1	1	0
Mr. Sidney Spokes	2	2	0
Dr. Frank Fawssett	2	2	0
Dr. E. A. Seymour	0	10	6
Dr. Hugh Playfair	5	5	0
Mr. A. E. Kinsey-Taylor	1	1	0
Dr. A. E. Godfrey	2	2	0
Dr. W. Bradbrook	0	10	6
Dr. Roche	1	1	0
Dr. Isabella Macdonald	2	2	0
Dr. J. S. Swain	0	2	6
Sir Seymour J. Sharkey	2	2	0
Dr. E. Hamilton Kyle	2	2	0
Dr. E. H. Walker	1	0	0
Dr. G. C. King	3	3	0
Dr. C. Andrews	1	1	0
Mr. W. R. Rollison	10	10	0
Sir Dyce Duckworth, Bt.	3	3	0
Mr. H. H. Marsden (collected by)	1	5	0
Dr. Crawford Watson	1	1	0
Dr. J. P. Scatchard	2	2	0
Dr. J. Wallis B. Rason	1	1	0
Dr. F. J. Nicholls	1	10	0
Dr. R. Mathewson	1	0	0
Dr. G. A. Crace-Calvert	5	0	0
Dr. Stopford Taylor	5	0	0
Dr. Thomas Wilson	2	2	0
Dr. Hammond	1	1	0
Mr. David Wallace, C.M.G.	10	10	0
Dr. Sunderland	1	1	0
Mr. J. B. Lawford (for eight months)	4	0	0
Dr. James Taylor	3	3	0
Dr. J. H. Arthur (for twelve months)	6	0	0
Dr. F. J. Turner	0	5	0
Dr. J. P. A. Gabb	2	2	0
Mr. Harbord	2	2	0
Dr. J. M. N. Popple	1	1	0
Dr. Hugh Davies	3	3	0
Dr. E. Croft Watts	1	1	0
Dr. Jacob Pickett	0	10	6
Major Cyril H. Walker, R.A.M.C.T.	3	3	0
Surg.-Col. H. Habgood	1	1	0
Dr. C. E. Michael	1	1	0
Dr. Hector Mackenzie	5	5	0
M.D.	0	5	0
"Kappa"	1	1	0
Dr. and Mrs. Reichwald	5	0	0
"A Sympathiser"	1	1	0
Dr. A. E. Causton	2	2	0
Dr. J. W. Sandoe	1	1	0
Dr. V. A. Chapman	10	0	0
Dr. J. C. Guthrie	1	1	0
Dr. Neville	1	1	0
Dr. A. S. Wilson	2	2	0
Dr. H. M. Stewart	1	1	0
Dr. E. G. Cameron	2	0	0
Dr. N. H. Pike	1	1	0
Dr. S. H. Lee	5	5	0
Dr. R. V. Solly	1	1	0
Dr. D. Matheson Mackay	2	2	0
Dr. J. A. Sanderson	1	1	0
Dr. Lambert Lack	3	3	0
Dr. J. H. Witham	1	1	0
Mr. E. H. Howlett	1	1	0
Dr. G. Baynton-Forge	5	5	0
Dr. C. Elliott	2	2	0
Dr. C. H. B. Shears	2	0	0
Dr. J. Medley Wood	1	1	0
Dr. G. H. Stowe	2	2	0
Dr. T. M. Strang	5	0	0
Dr. John Watson	1	1	0
Dr. H. S. Renshaw	5	0	0
Drs. Hartham and Harrison	5	5	0
Dr. Joseph Horne	2	0	0
Dr. A. T. Simpson	5	5	0
Dr. H. A. Mawdsley	1	0	0
Dr. A. Marshall	1	1	0
Dr. Murdoch	2	2	0
Dr. F. Stevenson	1	1	0
Dr. J. Gordon Black	2	2	0
Dr. E. W. Dewey	1	1	0
Dr. Roper	2	2	0
Dr. A. H. Radcliffe	2	2	0
Dr. Frank Godfrey	2	2	0
Major H. E. Martis	3	0	0
Mr. W. F. Brook	10	0	0
Dr. R. M. Fraser	1	0	0
Dr. Claude Wilson	2	0	0
Dr. Arnold Lyndon	2	2	0
Dr. Sinclair White	5	0	0
Dr. Thomas Drapes	2	2	0
Miss S. M. Witts, M.D.	3	3	0
Mr. R. Lawford Knaggs	2	2	0
Professor Delépine	2	2	0
Professor Sims Woodhead	3	3	0
Dr. J. Mitchell Wilson	1	1	0
Dr. Priestley Leech	1	1	0
Dr. Annacker	2	2	0
Dr. J. F. Forster	3	3	0
Mr. Robert Jaques	1	1	0
Dr. John Grimes	2	2	0
J. G. C. Mancunfensis	5	0	0
Major E. Rowland Fothergill	1	1	0
Dr. D. Elcum (for twelve months)	6	0	0

Monthly (m.) and Quarterly (q.) Subscriptions.

Sir Alfred Pearce Gould (m.)	5	0	0
Mr. E. Spencer Evans (m.)	0	10	0
Dr. Elsie R. Chubb (£2 2s. and £2 2s. q.)	2	2	0
Dr. Alfred Cox (m.)	1	1	0
Dr. A. B. Stevens (m.)	1	0	0
Dr. Egbert C. Morland (m.)	0	10	6
Dr. K. J. Dougall (m.)	0	10	0
Dr. Legat (to continue for 6 m.)	0	10	0
Sir Thomas Barlow (m.)	0	10	0
Dr. A. E. Naish (m.)	0	10	0
Dr. J. W. Papillon (q.)	0	10	6
Dr. Hyla Greves (m.)	0	10	0
Dr. W. Ernest W. Good (m.)	0	10	0
Major E. Rowland Fothergill, R.A.M.C. (m.)	0	10	0
Mr. J. B. Lawford (10s. per m. for 8 m.)	4	0	0
Dr. J. H. Arthur (10s. per m. for 12 m.)	6	0	0
Dr. D. Elcum (for 12 m.)	6	0	0

It will be observed with pleasure that the system of monthly subscriptions has begun to attract attention, and it is trusted by the Committee that this method of supporting the movement, which in these times may have its advantages for many willing subscribers, will prove a source of steady income for some time to come. It will be seen that several contributors in sending donations have indicated that although the payment is made in bulk it is to be taken as representing a series of monthly subscriptions; the names occur in both lists of acknowledgements.

Subscriptions to the Fund should be sent to the Treasurer,

Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

Direct Transfusion of Blood.

Captain H. H. King, I.M.S., writes: With reference to Colonel Hull's article on artery-vein transfusion of blood in the Journal of November 24th, 1917, p. 683, would it not be possible and more convenient to use vein to vein transfusion? If the venous circulation of the donor be obstructed by a rubber bandage round the arm the pressure in the veins of his forearm would, I should think, be quite sufficient to transfer 600 c.cm. or more of blood into a vein of the recipient in a short time. Certainly the venous pressure in the forearm on occasions when I have performed venesection has appeared high. Donors would more readily consent to the ligature of one of the superficial veins of the forearm than allow of the ligature of their radial arteries.

Lemon Juice in Severe Jaundice.

We are indebted to Dr. J. Pereira Gray (Exeter) for the notes of the following case: I was called a year ago to see a man, aged 72. I was informed by his sister that he was suffering from cancer of the liver and was very seriously ill. The patient stated that his illness was of two years' duration and that he had been seen by five general practitioners and one consulting physician, who were unanimous that he had cancer of the liver. He was given hypodermic injections of morphine three times a week. The skin and conjunctivae were deep yellow. There was a lump the size of an orange in the epigastrium. He was unable to sit up on account of excruciating pain in the dorsal region. The urine was black and the motions white. I told him the former opinions he had as to his condition were probably correct, and by way of treatment advised him to drink daily the juice of half a lemon. Two days later I found the urine had assumed a brown colour and that the man himself felt much better. In a week the urine was amber-coloured. Within a month there was no trace of yellow in the skin or conjunctivae and the lump in the epigastrium had disappeared. There was no pain in the back. Two months later I saw him running to catch a tram. This case shows the proverbial difficulty of definitely diagnosing malignant disease of the internal viscera. It also shows that in all cases of jaundice so simple a remedy as lemon juice is well worth a trial.

Unusual Length of Menstrual Life.

Dr. Alexander Blair (Helmsley, Yorkshire) writes: A patient whom I am now attending has been menstruating regularly, except during pregnancy and the puerperium, for the long period of forty-five years. She informs me that she began to menstruate at the early age of 11 and she is now in her fifty-sixth year. She has been pregnant eleven times and has borne ten healthy children, the confinements being quite normal; the other pregnancy ended in miscarriage at the sixth month. Until the last four years she has lived the healthy life of a busy housewife of the middle class. The periods are still perfectly regular, lasting for about six days. For several years she has suffered from periodical attacks of vomiting, which become intensified, sometimes to a distressing extent, immediately before and during the menstrual period. The condition has persisted in spite of treatment. Some time ago, on my advice, she consulted a specialist, who agreed with my diagnosis of "nervous vomiting probably uterine in origin." The uterus appears to be quite normal with the exception of a somewhat unusual hardness apparently due to fibrosis. Her elder sister began menstruating at the age of 15, and, in her case also, the menopause did not come until she was 56. There is no history of any other female relative having been the subject of such a lengthened menstrual life. The patient is a big woman of fine physique.

An Object Lesson for Antivaccinists.

The Ohio Public Health Journal for December, 1917, records an instructive example of the danger to which neglect of vaccination exposes a community. A coloured girl from North Carolina soon after her arrival developed small-pox at Waterbury, Connecticut, in June, 1916. The case remained unknown until another person contracted the disease from her. Investigation then revealed ten other cases, all in Waterbury. Other people known to have been exposed were vaccinated and no other cases were reported in July or August. Several other cases, however, came to light in September, and it was found that unreported cases had existed during the preceding two months. From that time onwards further cases were reported in Waterbury and neighbouring towns, and there were others in various places throughout the State of Connecticut. In all but two of these infected localities, however, the exposures were traced to Waterbury. Of the 378 cases reported during the ten months from June, 1916, till March, 1917, practically all were traceable to the coloured girl. Only 10 had been vaccinated within the fifteen previous years. Five of these 10 had been vaccinated thirty years or more before exposure. Waterbury, according to the Secretary of the State Board of Health, has for years been "the Connecticut stronghold for antivaccinationists." It is estimated that only 45 per cent. of its population had been vaccinated at the time of the outbreak of small-pox. Compulsory vaccination of children was not achieved until January 1st. Before that date fifty school children had been attacked; from January 1st till April 1st not one contracted the disease. In Bridgeport, New Haven, and Hartford, cities with populations of from 110,000 to 150,000, within thirty to thirty-two miles of Waterbury, vaccination had been thorough in the past, the percentage of protected persons being estimated at 80 to 85 per cent. These places escaped infection by small-pox during the Waterbury invasion, except for a single case in Hartford. Not one death occurred in the 25,000 vaccinations performed in Waterbury during the ten months of the epidemic and among several thousand factory hands.

Flames from Wounds.

A striking title to catch the wandering eye is a device well known to the journalist, and sometimes, it must be confessed, the title is the best part of an article. On the other hand, the seeker after curiosities may plume himself, like the successful hunter of bookstalls, on finding a treasure concealed under a modest title. Thus it is surprising to find that Temporary Surgeon K. A. I. Mackenzie's article, "Some Observations in a Recent Action" (*Journal of the Royal Naval Medical Service*, 1918, iv, 205-6), is an account of two cases of wounds received in action which emitted flames. The first case was that of a leading signalman killed in action and found at the medical distributing station to have a transverse wound on the dorsum of the hand; on separating the apposed edges of the wound a small flame about the size of a finger-nail shot out accompanied by a smell of acetylene; this flame went on for some hours. The second case was also that of a signalman, whose foot, almost blown off, had a similar minute flame in the base of the wound. The explanation was that the men had been standing together at the time when a shell hit a lifebuoy with its attached case of calcium phosphide close to them, and, besides killing one and wounding the other, drove small pieces of calcium phosphide into their wounds. The blood of the wounds made the calcium phosphide burn just as water ordinarily does.

A Bogus M.D.

At Greenwich police court, on April 12th, Emmanuel Lawrence, of 195, High Street, Lewisham, pleaded guilty to wilfully and falsely pretending to be, and taking and using the name, title, addition, and description of M.D., thereby implying that he was registered under the Medical Acts. Mr. W. E. Hempson, prosecuting on behalf of the Medical Defence Union, said that defendant was manager to an optician, and it seemed that when people came to him about their sight, his custom was to suggest they were suffering in a manner which called for medical treatment. Defendant professed to have medical knowledge, examined the patients, and gave them prescriptions, which it was contended no chemist would have dispensed unless misled into the belief that they were written by a medical man. It was for this purpose, Mr. Hempson suggested, that the title M.D. was used. Defendant, moreover, charged fees quite equal to those of a general practitioner. In one case, under the guise of being a medical man, he induced a patient to allow him to examine her with a stethoscope, and told her that she had advanced valvular heart disease. This so frightened her that she went to her medical adviser, who, finding no such disease, wrote to defendant, and received an impudent reply. One of the prescriptions contained strychnine in small doses and another nitroglycerin. It was stated on behalf of the defendant that he had borne a good character, was partially paralysed, suffered from heart disease, and his mind was not stable. He had a great idea of his own importance and ability, and a mania for imposing prescriptions upon people, including his own brother. The magistrate observed that the state of defendant's health was irrelevant; he was a most dangerous man, guilty of offences against the Medical Acts, of fraud, and of assaults on women under the pretence that he was a doctor. He imposed a fine of £40, with 20 guineas costs, or three months' imprisonment in default.

Mice and Boys.

Dr. Miller (Govan) writes: During my school medical inspection this week a poorly nourished boy was brought to me by his mother. After giving her explicit directions regarding his diet, she told me she had been recommended to give him a field mouse, but had not done so as she thought it would give him "the jaundice."

The following appointments for certifying factory surgeons are vacant: Motherwell (Lanarkshire), Newton Abbot (Devonshire).

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CEREBRAL OEDEMA (EXCESS CEREBRO-SPINAL FLUID):

ITS CAUSATION AND SURGICAL TREATMENT.

BY

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On my return recently from India I read with interest an article by Professor Halliburton on the possible functions of the cerebro-spinal fluid.[1] The article terminated with an appeal for closer co-operation between the physiologist and the neurologist in an attempt to elucidate some of the problems relating to cerebro-spinal fluid. May not the surgeon be invited to this conclave? Surely his experience is likely to be of some value, more especially when he has spent a good many years of his life in the study of injuries and diseases of the brain, and when he has practical experience of problems relating to cerebro-spinal fluid. I have discussed such questions for many years in the wards of the hospital; I have demonstrated on many occasions in the operating theatre the existence of *plus* cerebro-spinal fluid; and now, as the result of Eastern experience, I have further points to bring forward showing the conditions that may lead to excess fluid, the pressure symptoms associated therewith, and the results obtained by surgical treatment.

In discussing this excess of cerebro-spinal fluid, I would utilize the original term applied to a description of the naked eye appearances of brain and membranes when soaked in an excess of fluid, "cerebral oedema." It is both comprehensive and expressive, and it harmonizes with my ideas as to causation. It will therefore be retained throughout.

DEFINITION OF CEREBRAL OEDEMA.

To obviate any possible misconception as to what I mean by cerebral oedema, let me first picture the conditions as seen by the veriest novice in any typical case.

When the dura mater is incised in an operation for subtemporal decompression, carried out for the conditions under discussion, clear cerebro-spinal fluid at once escapes from the subdural space, often spurting out as if under considerable pressure. Under normal conditions there is no fluid in the subdural space, and none escapes when the subdural space is exposed. In the event, however, of considerable excess, the cerebro-spinal fluid which normally occupies the subarachnoid space is forced by the increasing pressure between the cells of the arachnoid membrane into the subdural space. This escape of fluid from the subarachnoid space is not problematical. It can be seen in any typical case of cerebral oedema when the dura mater is incised. The arachnoid presents a "weeping" appearance, the tears collecting into rivulets and running away at the lower part of the exposed area. In relation to the cortical veins, lying in the cerebral sulci and embedded in the subarachnoid tissue, little rivers of fluid can be seen with the naked eye, fluid exuding therefrom and contributing to the general pool that collects below. The brain presents a boggy appearance, and the general surface cortical oedema can be very prettily demonstrated by applying gentle pressure with a sponge, the excess fluid being momentarily squeezed aside, to return as a wave so soon as the pressure is removed. The surface of the brain looks like a very wet sponge.

This excess fluid, seen at the operation, will continue to run away during the sewing up of the wound, and that it continues to run away from the surface of the brain into the subtemporal tissues, both during the healing process and subsequently, is shown by the frequent presence in the temporal region of a fluid swelling; it demonstrates the success of the operation, being the proof that the intracranial pressure has been relieved by the draining away of the fluid excess. That this swelling is a fluid collection can be proved directly both by transillumination and by aspiration, and indirectly by means of lumbar puncture. I have frequently carried out lumbar puncture when it seemed advisable to lessen the degree of temporal swelling, the removal of fluid being followed by considerable diminution in the size and tenseness of the swelling. In the more favourable cases, such as those mentioned in this paper, the swelling is never very marked, and it gradually recedes till eventually the temporal region lies flush with the surrounding area.

If lumbar puncture be carried out in a case of cerebral oedema, as a preliminary diagnostic measure, the excess fluid is demonstrated, both by the pressure under which it escapes and the quantity that can be collected in a given period of time.

CAUSE.

What is the cause of this cerebro-spinal excess? Professor Halliburton, from physiological experiments, states that there are three groups of substances which promote the flow and increase the pressure of the fluid, independently of those which effect it secondarily by altering the blood pressure—excess of CO_2, volatile anaesthetics, and extract of choroid gland or brain. I leave these physiological causes and turn attention to the cerebro-spinal flow in relation to alterations of blood pressure. Professor Halliburton says that the arterial pressure has but little effect on the amount of secretion. I pin my faith, however, on a very definite relation between the amount of cerebro-spinal fluid present intracranially and the intracranial venous pressure, for the following reasons:

1. It is accepted that the cerebro-spinal fluid is formed either as an active secretion from the choroid plexuses of the lateral, third and fourth ventricles, or by a process of filtration through the choroid capillaries.

2. It is accepted that the greater part of this fluid passes from the ventricular spaces through the foramina in the roof of the fourth ventricle to the cerebral subarachnoid system and spaces.

3. It is accepted that it exists at very much the same pressure as the intracranial venous system, but slightly above the venous pressure.

4. It is accepted that, under normal conditions, it is absorbed, as formed, into the cerebral venous channels, more especially into the lateral lacunae of the superior longitudinal sinus. It would be unwise, in the present state of our knowledge, to make any very definite statement as to whether this is a mere mechanical transmission of one fluid of a lower specific gravity and of higher pressure into another, through a permeable wall, or whether the walls of the veins possess a certain selective action. In all probability the vessels do exercise a selective action, but, under the more ordinary conditions, the absorptive process is probably purely mechanical.

Anyhow, this venous absorption, as I may call it, must be dependent on the healthy condition of the walls of the cerebral venous channels, and on the intracranial venous pressure. Consequently, if for any reason the absorptive capacity of the veins is impaired, either by disease or injury, due absorption cannot take place and cerebro-spinal fluid collects in excess in all possible spaces—in the subarachnoid system, in the ventricles, on the surface of the brain and in the subdural space, producing, as a result, a typical state of cerebral oedema.

For example, if, as the result of heat-stroke, the tunica intima of the cerebral sinuses and veins is impaired, temporarily or permanently, cerebro-spinal fluid will collect in excess. Again, if as the result of some head injury the intracranial venous pressure is considerably raised, so as to be well above the tension of the cerebro-spinal fluid, the normal rate of absorption of cerebro-spinal fluid will be impeded, and it will collect in excess.

There is a third hypothesis, that toxic conditions, acting on the choroid plexuses, lead to an increase in the rate of secretion. Of this, however, there is no considerable evidence.

In the earlier stages of cerebral oedema the excess fluid will escape in the following manner: a small quantity passes down the neural canal, to be withdrawn, perhaps, by lumbar puncture, with some temporary relief to the increasing intracranial pressure; a still smaller quantity permeates through the various emissary channels at the base of the skull, to be absorbed by the extracranial venous channels. As the fluid increases in quantity these means of escape prove inadequate, and it accumulates first in the subarachnoid region, bogs the surface of the brain, and finally exudes through the arachnoid into the subdural space, giving rise to the typical picture of a case of cerebral oedema.

Some further light is thrown on the question by my work in the East. A large number of cases were admitted

to hospital with the diagnosis "heat effects," the great majority coming from Mesopotamia, in batches according to the climatic conditions prevailing in that country. It is obvious that many difficulties were encountered when we endeavoured to classify these cases and group them according to the diseases from which they really suffered. Some proved to be malarial, others were suffering from diseases of the typhoid group, and so on, but there remained a considerable number, running into hundreds, who proved negative to all tests, and concerning whom, therefore, I retained the original diagnosis (heat effects).

Symptoms.

The symptoms from which these men were suffering were as follows:

1. *Headache, and General Mental Condition.*

Headache, dating from the beginning of the attack, was very severe at first, and then became chronic. When in hospital it was observed that the men were very listless, disinclined to leave the ward, and then only after the heat of the day. They suffered from more or less persistent pains in the head, and were indeed seldom free from headache. They were always worse towards the evening, especially between 5 p.m. and 8 p.m. The pain was usually frontal. During the many exacerbations, the men sometimes retired to bed or to the quieter and darker parts of the ward, disliking the light and their fellows, and burying their heads beneath the bedclothes. They were irritable and despondent. Drugs were of little avail for the relief of the headache, procuring only temporary alleviation at the best.

Operative measures, when proposed, were usually accepted with eagerness, and in some two or three cases the men implored me to do something, at whatever risk, for their relief. The general severity of the headache and the mental effects produced on the patients can be gauged by this ready acceptance of operative measures.

2. *Vomiting.*

This was present only in the worst cases, and then only in definite relation to the exacerbations of headache. Nausea, of the "sick headache" type, was almost constantly present.

3. *Ocular Changes.*

Photophobia, more especially during the heat and glare of the day, was a marked feature. True papilloedema was never observed. Every case was examined by our ophthalmologist, but, with the exception of a few in which the retinal vessels appeared rather fuller than usual, there was no definite fundus changes. I anticipated more, in view of the very definite relation between papilloedema and considerable increase of intracranial pressure. However, as papilloedema is not necessarily present in intracranial new growths, even when of considerable size, the absence of any fundus changes in the cases under discussion is quite explicable.

4. *Pulse-rate and Blood Pressure.*

During the exacerbations of headache the pulse-rate was slowed to 50 or 60, and the systolic blood pressure raised to 140 or 150 mm. Hg—no great rise of blood pressure, but, by taking controls, it was found that the average blood pressure of patients in India was below the normal.

5. *Reflexes.*

There was a marked tendency to exaggeration of reflexes, both superficial and deep. The men themselves were very shaky and nervous, with tremors of the hands, etc.

6. *Temperature.*

The temperature was slightly raised as a general rule, with further elevations during the more severe periods of headache, etc.

7. *Epileptiform Convulsions.*

Epileptiform convulsions occurred in eight of eleven cases here recorded—an unusually high percentage, but capable of explanation. The convulsions were sometimes of the most violent description, each succeeding attack tending to be more severe than the preceding. The men usually knew when to expect the seizure, warned by some excess of headache, curious tinglings, etc. Consciousness was not always lost, the senses perhaps being sometimes retained throughout a mild attack, and in the early stages of the more severe fits. The duration was variable—from five minutes up to three hours. These men required supervision, and during the convulsions as many as five men were required to hold them down and protect them from self-hurting. Lips and tongue were seldom bitten. Frothing at the mouth was unusual. Struggling was violent, and the face was markedly congested. The blood pressure was raised, and the pulse-rate slowed. After the convulsion was over there was much prostration, sometimes lasting two or three days, associated with headache.

In frequency the fits varied; sometimes a day or two intervened between the attack, or the patient might be free for a week or more.

When the attack lasted two to three hours the patient passed from fit to fit without regaining consciousness. The convulsions were general and it was quite exceptional to see any localizing features.

Several of the cases in which these epileptiform convulsions were observed gave a previous history of brain disturbance of some sort or other—fits, brain fever, head injury, etc. In three cases only were the men normal in every respect. This rather strengthens my views as to the cause of cerebral oedema. If the excess cerebro-spinal fluid is dependent on deficient absorption into the cerebral venous channels, it is only to be expected that antecedent injury or disease would add to the liability to the conditions as pictured. The strain of active service, heat-stroke, shell shock, overwork, etc., would still further impair the rate at which the fluid is absorbed and tend to the accumulation of cerebro-spinal fluid and the advent of definite cerebral oedema.

Interpretation of Symptoms.

All these symptoms, pointing as they do to a general increase of intracranial pressure, together with the *plus* cerebro-spinal pressure (lumbar puncture), and the very satisfactory results obtained by decompression, show that the excess of cerebro-spinal fluid was directly responsible for the development of the symptoms enumerated. Pressure alone might suffice to produce the convulsions, exercised as it was on a highly excitable cortex, the result of heat-stroke, cerebral malaria, etc. It is possible, however, that certain toxic products contained in the fluid may have led to the development of these explosive attacks. Still, by reason of the immediate benefit obtained in every case by simple drainage of excess fluid and the normal characteristics of the fluid collected at the operation, I am inclined strongly to the view that pressure alone sufficed.

Treatment.

Many cases presenting these symptoms were admitted to hospital during my fifteen months' service in the East, and seven were submitted to operation. I give a short account of the first case so treated, with an abstract of the six other cases, and, as a control, a brief account of four cases refusing operation.

Case I.

A R.A.M.C. orderly was admitted to hospital at Amara, Mesopotamia, on June 10th, 1915, suffering from heat-stroke. After recovering he was put on light duty in the wards. There he had several fits which were not controlled by bromides, etc. He was invalided to India; he suffered from two fits at Basra whilst awaiting ship, and one during the voyage. He was admitted to hospital in India on August 13th, 1916, complaining of severe headache, with ready excitement and frequent prostration. His eyesight was said to have been failing for the past few months. The retinal veins were rather dilated and tortuous, especially on the right side. The headache persisted throughout the day, becoming worse in the evening. It never actually left him free, and there were marked exacerbations. All reflexes were *plus*. Tremors of the limbs on exertion. Blood pressure equal to 150 mm. Hg. The pulse-rate tended to be slow during periods of headache. The temperature was never above 100°, and was usually normal.

August 18th. Fit, heralded by abdominal pain and tightness of the chest. Did not lose consciousness; fit lasted fifteen minutes. Twitching of limbs general, then stiffness and general rigidity, followed by severe headache.

August 25th. Severe headache and feeling of a fit coming on. Staved off by walking about.

September 2nd. Severe headache which preceded a violent epileptiform seizure; first clonic spasms of arms, then tonic contraction, spreading to both lower extremities and equal on the two sides. Conscious during the first part of the fit, then senses lost. Fit lasted thirty minutes. Restless afterwards, with severe headache.

September 6th. Numb feelings in both hands, but fit staved off as before.